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ABSTRACT

Designed to supplement the descriptive authoring flowcharts presented in a companion volume, this manual includes specific guidance, examples, and other information referred to in the flowcharts for the implementation of the second phase of the Instructional Systems Development Model (ISD). The introductory section includes definitions; descriptions of classification systems and flowchart symbols; instructions for using the Job Aid Manual; a description of the Job Aids Resource Manual; an explanation of the reporting system; information on the use of field surveys and panels; and an example of a closed form questionnaire together with the procedures for its administration. Activities covered in Phase II--DESIGN are (1) development of objectives, (2) development of tests, (3) description of entry behavior, and (4) determination of sequence and structure. (LLS)

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JOB AID MANUALS FOR PHASE II-DESIGN OF THE INSTRUCTIONAL SYSTEMS DEVELOPMENT MODEL

MANPOWER AND EDUCATIONAL SYSTEMS TECHNICAL AREA

MAY 1980

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The purpose of the research was to develop job aids for the activities identified in the Instructional Systems Development mode (ISD, TRADOC Pamphlet 350-30). Job aids are available for each of the five phases of the ISD model - ANALYZE, DESIGN, DEVELOP, IMPLEMENT, and CONTROL. Each job aid is composed of a Descriptive Authoring Flowchart and a Job Aid Manual. This volume, covering Phase II--DESIGN, contains an Introduction to the Use of the Job Aids and the Job Aid Manuals for Blocks II.1 through II.4. The Descriptive Authoring Flowcharts for Phase II are available in a companion document.

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FOREWORD

The Computer-Based Instructional Systems Team of the US Army Research Institute for the Behavioral and Social Sciences performs research and development in the area of educational technology that applies to military training. Of interest are methods for training individuals to develop and utilize instructional courseware in reasonable time, at acceptable cost. ARI research in this area is conducted under Army Project 2Q263743A794, FY 80 Work Program.

This Research Product is one of a series of 10 volumes designed to provide guidance on the application of the Instructional Systems Development model. The work was accomplished by Mr. Russel E. Schulz and Mrs. Jean R. Farrell, Human Resources Research Organization, Contract No. DAHC19-78-C-0010 and personnel of the ARI Manpower and Educational Systems Technical Area. Personnel from the Directorates of Training Development at Ft. Belvoir, VA and Ft. Gordon, GA provided assistance in the evaluation of the work.

JOSEPH ZEIDNER
Technical Director

JOB AID MANUALS FOR PHASE II-DESIGN OF THE INSTRUCTIONAL SYSTEMS DEVELOPMENT MODEL

BRIEF

Requirement:

To develop a series of job aids for the activities identified in the Instructional Systems Development Model (ISD, TRADOC Pamphlet 350-30).

Procedure:

A series of job aids were designed and developed for each of the five phases of the ISD model: ANALYZE, DESIGN, DEVELOP, IMPLEMENT, and CONTROL. Each job aid is comprised of Descriptive Authoring Flowcharts and a Job Aid Manual which provide specific guidance, examples, and references necessary to produce the product specified by the ISD Block it covers.

Utilization:

These job aids will be used by military training personnel in meeting the requirements of the ISD model.

JOB AID MANUALS FOR PHASE II-DESIGN OF THE INSTRUCTIONAL SYSTEMS DEVELOPMENT MODEL

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WHAT ARE JOB AIDS?

- Job Aids are intended to be stand-alone, step-by-step procedural guides which we hope will permit you to turn out quality instructional products quickly and easily. We also hope that they will be equally useful to individuals at all experience levels of the instructional systems development process.
- Job Aids are intended to address real needs. Prior to the development of the Job Aids, instructional technology personnel (individuals like yourself) at the U.S. Army Signal Center and the U.S. Army Engineer School were surveyed to determine specific ISD needs—those areas in which they had the greatest need for assistance and information. Emphasis was placed on satisfying these needs in the development of the Job Aids.
- Job Aids use the same classification system for identifying the activities that must be performed in instructional systems development (ISD) as does TRADOC Pamphlet 350-30 (Interservice Procedures for Instructional Systems Development).

WHAT IS THE CLASSIFICATION SYSTEM USED IN TRADOC PAMPHLET 350-30 AND JOB AIDS?

- TRADOC Pamphlet 350-30 suggests that instructional systems development be conducted in five phases:
    - Analyze
    - Design
    - Develop
    - Implement
    - Control
- For those of you who are unfamiliar with TRADOC Pamphlet 350-30 we suggest you read the brief description of each phase of the ISD process as shown in Table 1. In the TRADOC Pamphlet each ISD phase is divided into specific activities called ISD blocks. Table 2 shows these ISD blocks and Table 3 shows the outcome of each block.
- Job Aids cover the activities required for the first three phases of the TRADOC Pamphlet (i.e., Analyze, Design, and Develop instructional systems). The Aids cover each ISD block within these phases except for ISD Block I.1, Analyze Job.

Table 1

FIVE PHASES OF INSTRUCTIONAL SYSTEMS DEVELOPMENT (ISD)

THE FIVE PHASES ARE:

PHASE I **ANALYZE**	Inputs, processes, and outputs in Phase I are all based on job information. An inventory of job tasks is compiled and divided into two groups: tasks not selected for instruction and tasks selected for instruction. Performance standards for tasks selected for instruction are determined by interview or observation at job sites and verified by subject matter experts. The analysis of existing course documentation is done to determine if all or portions of the analysis phase and other phases have already been done by someone else following the ISD guidelines. As a final analysis phase step, the list of tasks selected for instruction is analyzed for the most suitable instructional setting for each task.
PHASE II **DESIGN**	Beginning with Phase II, the ISD model is concerned with designing instruction using the job analysis information from Phase I. The first step is the conversion of each task selected for training into a terminal learning objective. Each terminal learning objective is then analyzed to determine learning objectives and learning steps necessary for mastery of the terminal learning objective. Tests are designed to match the learning objectives. A sample of students is tested to insure that their entry behaviors match the level of learning analysis. Finally, a sequence of instruction is designed for the learning objectives.
PHASE III **DEVELOP**	The instructional development phase begins with the classification of learning objectives by learning category so as to identify learning guidelines necessary for optimum learning to take place. Determining how instruction is to be packaged and presented to the student is accomplished through a media selection process which takes into account such factors as learning category and guideline, media characteristics, training setting criteria, and costs. Instructional management plans are developed to allocate and manage all resources for conducting instruction. Instructional materials are selected or developed and tried out. When materials have been validated on the basis of empirical data obtained from groups of typical students, the course is ready for implementation.
PHASE IV **IMPLEMENT**	Staff training is required for the implementation of the instructional management plan and the instruction. Some key personnel must be trained to be managers in the specified management plan. The instructional staff must be trained to conduct the instruction and collect evaluative data on all of the instructional components. At the completion of each instructional cycle, management staff should be able to use the collected information to improve the instructional system.
PHASE V **CONTROL**	Evaluation and revision of instruction are carried out by personnel who preferably are neither the instructional designers nor the managers of the course under study. The first activity (internal evaluation) is the analysis of learner performance in the course to determine instances of deficient or irrelevant instruction. The evaluation team then suggests solutions for the problems. In the external evaluation, personnel assess job task performance on the job to determine the actual performance of course graduates and other job incumbents. All collected data, internal and external, can be used as quality control on instruction and as input to any phase of the system for revision.

Table 2

ISD BLOCKS IN EACH OF THE FIVE ISD PHASES

THE BLOCKS IN EACH PHASE ARE:

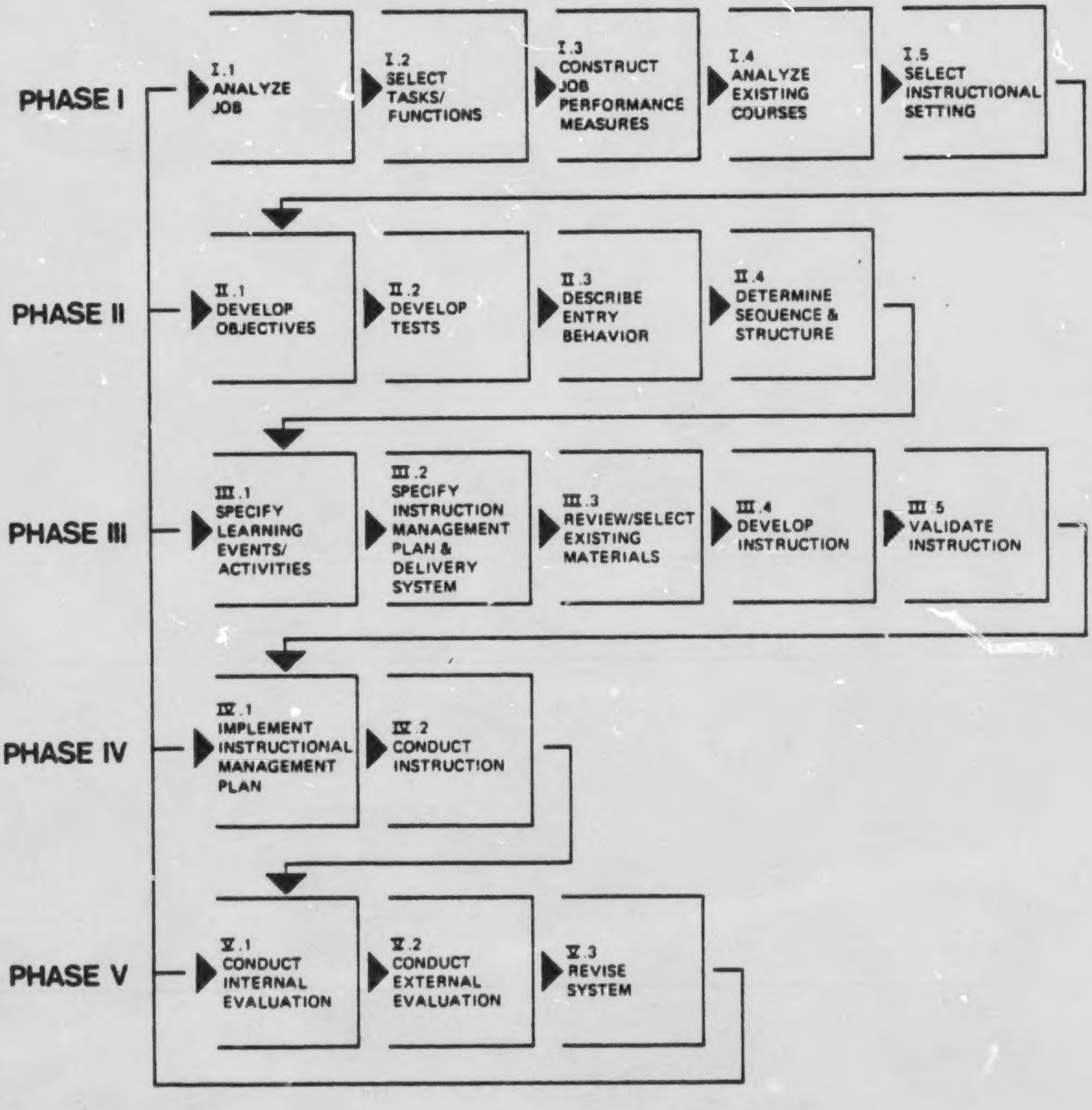

PHASE I
I.1 ANALYZE JOB
I.2 SELECT TASKS/ FUNCTIONS
I.3 CONSTRUCT JOB PERFORMANCE MEASURES
I.4 ANALYZE EXISTING COURSES
I.5 SELECT INSTRUCTIONAL SETTING
PHASE II
II.1 DEVELOP OBJECTIVES
II.2 DEVELOP TESTS
II.3 DESCRIBE ENTRY BEHAVIOR
II.4 DETERMINE SEQUENCE & STRUCTURE
PHASE III
III.1 SPECIFY LEARNING EVENTS/ ACTIVITIES
III.2 SPECIFY INSTRUCTION MANAGEMENT PLAN & DELIVERY SYSTEM
III.3 REVIEW/SELECT EXISTING MATERIALS
III.4 DEVELOP INSTRUCTION
III.5 VALIDATE INSTRUCTION
PHASE IV
IV.1 IMPLEMENT INSTRUCTIONAL MANAGEMENT PLAN
IV.2 CONDUCT INSTRUCTION
PHASE V
V.1 CONDUCT INTERNAL EVALUATION
V.2 CONDUCT EXTERNAL EVALUATION
V.3 REVISE SYSTEM

Table 3

OUTCOMES OF ISD BLOCKS

THE OUTCOMES OF THE BLOCKS ARE:

I	.1	a list of tasks performed in a particular job.
	.2	a list of tasks selected for training.
	.3	a job performance measure for each task selected for instruction.
	.4	an analysis of the job analysis, task selection, and performance measure construction for any existing instruction to determine if these courses are usable in whole or in part.
	.5	selection of the instructional setting for task selected for instruction.
II	.1	a learning objective for and a learning analysis of each task selected for instruction.
	.2	test items to measure each learning objective.
	.3	a test of entry behaviors to see if the original assumptions were correct.
	.4	the sequencing of all dependent tasks.
III	.1	the classification of learning objectives by learning category and the identification of appropriate learning guidelines.
	.2	the media selections for instructional development and the instructional management plan for conducting the instruction.
	.3	the analysis of packages of any existing instruction that meets the given learning objectives.
	.4	the development of instruction for all learning objectives where existing materials are not available.
	.5	field tested and revised instructional materials.
IV	.1	documents containing information on time, space, student and instructional resources, and staff trained to conduct the instruction.
	.2	a completed cycle of instruction with information needed to improve it for the succeeding cycle.
V	.1	data on instructional effectiveness.
	.2	data on job performance in the field.
	.3	instructional system revised on basis of empirical data.

WHAT SOURCES OF INFORMATION WERE USED IN THE DEVELOPMENT OF JOB AIDS?

- Job Aids are not just a re-hash of TRADOC Pamphlet 350-30. We use the same classification system for ISD phases and the blocks within the phases as does the TRADOC Pamphlet. However, the guidance and information provided in the Job Aids come from a variety of sources, the TRADOC Pamphlet being only one such source. We have gathered information from any source that we could locate. If the information was judged to be good it was included in the Job Aids. In some instances the information in the Job Aid is based solely on the educational technology experience of the project staff.

- It is not within the scope of this Introduction to list all sources of information examined or used in the development of the Job Aids. However, in addition to TRADOC Pamphlet 350-30 examples of other sources of information would include the following types:
  - TRADOC Circulars
  - DA Pamphlets
  - Printed Guidance prepared by TRADOC Schools (e.g., U.S. Army Signal Center)
  - Army Research Institute Documents
  - HumRRO publications
  - Other military and civilian agencies

WHAT JOB AIDS ARE PRESENTLY AVAILABLE AND WHAT DO THEY CONSIST OF?

- There are thirteen Job Aids presently available. Each Job Aid is comprised of two documents. A brief description of each is provided below: (A complete description of how to use each is given on the pages that follow.)

  - Descriptive Authoring Flowcharts. The Descriptive Authoring Flowcharts (usually referred to as Flowchart Manuals) are the primary documents used in the Job Aids. They direct the user to specific guidance, examples and references provided in the Job Aid Manuals.

  - Job Aid Manuals. As stated above, the Job Aid Manuals provide the specific guidance, examples and references necessary to produce the product specified by the ISD Block they cover. In addition, each Job Aid Manual contains one or more Worksheets to use in the development of the product.

- Another important part of the Job Aids package is of course the document you are presently reading, Introduction to the Use of Job Aids and Job Aid Resource Manual.

- The specific Job Aids available are: (Flowchart Manual and Job Aids Manual for each).

  - Job Aid for Selecting Tasks for Training (ISD I.2)
  - Job Aid for Conducting Task Analysis (ISD I.3)
  - Job Aid for Analyzing Existing Courses (ISD I.4)
  - Job Aid for Selecting Instructional Settings (ISD I.5)
  - Job Aid for Developing Objectives (ISD II.1)
  - Job Aid for Developing Tests (ISD II.2)
  - Job Aid for Describing Entry Behavior (ISD II.3)
  - Job Aid for Determining Sequence and Structure (ISD II.4)
  - Job Aid for Specifying Learning Events and Activities (ISD III.1)
  - Job Aid for Specifying Instructional Management Plan and Delivery System (ISD III.2)
  - Job Aid for Review and Selection of Existing Materials (ISD III.3)
  - Job Aid for Developing Instruction (ISD III.4)
  - Job Aid for Validating Instruction (ISD III.5)

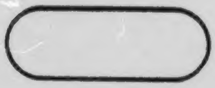
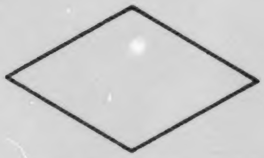
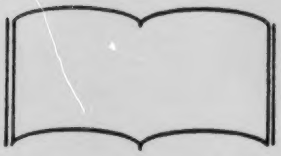
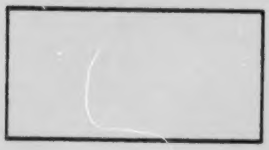
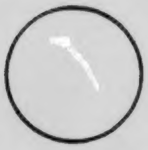
WHAT ARE THE MAIN PARTS OF THE FLOWCHART MANUAL?

- Scan through a few pages of your Flowchart Manual. Observe the following:
  - Flowchart symbols used
  - Instructions or questions within the flowchart symbols
  - Supplemental information opposite most of the flowchart symbols
  - Flowchart block and page numbering system
- For a complete description of each of the main parts of the Flowchart Manual see the pages that follow.

WHAT FLOWCHART SYMBOLS ARE USED IN THE FLOWCHART MANUAL?

- **Flowchart Symbols**

  — Only five symbols are used in the Flowchart Manual. These symbols and the instructions within them act as a road map to lead you step-by-step through the process of developing your particular product. We believe that after you have gotten used to using the Flowchart Manual you will find it a very useful control document. The five symbols used are as follows:

	**Start-Stop Symbol**	— Indicates either the start or stop of the activities called for in the Flowchart Manual.
	**Decision Symbol**	— Indicates that you must make a decision at this point which will determine the path that you take thru the Flowchart Manual.
	**Manual Symbol**	— Indicates that you are to refer to the Job Aid Manual for specific additional guidance or instruction shown in the symbol.
	**Rectangle Symbol**	— Indicates an activity that must be performed but does not require specific additional guidance or instruction in the Job Aid Manual. (In some cases the user is given the option of going to the Job Aid Manual to see a completed example of the activity called for in the rectangle symbol).
	**Go To Symbol**	— Indicates a branch to some other flowchart block. The branch will either be to a previously encountered block or will jump you over blocks that can be omitted.

WHAT INSTRUCTION IS PROVIDED WITHIN THE FLOWCHART SYMBOLS?

- Each flowchart symbol except the Decision Symbol contains a brief statement of the activity that you are to perform. If this activity requires the completion of part of a Worksheet the specific part of the Worksheet will be identified (remember, each Job Aid includes one or more Worksheets). Decision blocks always contain a question that can be answered with a yes or no answer. The branch you take after the decision block will depend upon your answer

WHAT IS THE PURPOSE OF THE SUPPLEMENTAL INFORMATION PROVIDED IN THE FLOWCHART MANUAL?

- The supplemental information that is located beside most of the flowchart symbols serves the following purposes:
  - Provides a more complete description of the steps or activities that must be performed in the ISD Block you are working in than does the flowchart itself.
  - Refers you to specific pages within the Job Aid Manual for specific guidance, examples and references needed for completing the activity called for in the flowchart block. (This is associated with the Manual symbol.)
  - For some flowchart blocks (rectangle symbol) examples of the completed activity are shown in the Job Aid Manual. The supplemental information indicates the specific page in the Job Aid Manual containing the example. However, the user has the option of going to the Job Aid Manual to see the example. (The Manual symbol, on the other hand, requires the user to go to the Job Aid Manual.)
  - Acts as an executive summary which will allow commanders and supervisors to obtain a picture of the activities required by the Job Aid without reading the entire Job Aid Manual.

WHAT IS THE FLOWCHART BLOCK AND PAGE NUMBERING SYSTEM?

- The flowchart block and page numbering system is as follows:
  - Flowchart blocks are numbered so that they can be easily referred to.
  - The page numbers in each of the 13 Flowchart Manuals are preceded by an identifying letter unique to a specific ISD Block. (E.g., The Flowchart Manual pages for ISD Block I.2 go from A-1 to A-15 whereas for ISD Block I.3 the Flowchart Manual pages go from B-1 to B-15.) This same page numbering system is also used in the Job Aid Manuals.

HOW DO I USE THE JOB AID MANUAL AND WHAT ARE THE MAIN PARTS OF IT?

- It is unlikely that you will need to refer to every page in the Job Aid Manual. As previously stated, the Job Aid Manuals are used as supplements to the Flowchart Manuals that direct you to specific pages within the Job Aid Manuals. Therefore, DO NOT ATTEMPT TO USE THE JOB AID MANUALS INDEPENDENTLY OF THE FLOWCHART MANUALS.

- Scan through a few pages of your Job Aid Manual. Observe the following:

  — Partial flowcharts shown at the top of pages

  — Questions written in script that appear on most pages

  — Completed, or partially completed examples of Worksheets

WHAT IS THE PURPOSE OF THE PARTIAL FLOWCHARTS AT THE TOP OF SOME PAGES OF THE JOB AID MANUAL?

- When you are referred to the Job Aid Manual you will find a partial flowchart at the top of the Job Aid Manual page. You are to remain working with the Job Aid Manual until you come to another partial flowchart. Then return to the Flowchart Manual.

- The partial flowcharts are identical to those shown in the Flowchart Manual. They serve as an additional reminder of the activity being dealt with at the moment.

WHAT IS THE PURPOSE OF THE QUESTIONS WRITTEN IN SCRIPT THAT APPEAR ON SOME PAGES OF THE JOB AID MANUAL?

- The questions written in script are our way of telling you what follows. They highlight such things as:
  - The purpose of performing a certain activity
  - How the activity is performed
  - What sources are available for performing the activity and how good they are
  - What the Worksheet looks like after the activity is performed

WHAT IS THE PURPOSE OF THE COMPLETED OR PARTIALLY COMPLETED EXAMPLES OF WORKSHEETS?

- As previously stated, every Job Aid Manual uses one or more Worksheets (located in a pocket at the back of the Manual). The Worksheets permit you to produce (and document) the product called for in the ISD Block.
- Whenever you are required to make an entry on a Worksheet an example of that type of entry will be shown in the Job Aid Manual and will usually be circled so as to make it stand out. It is hoped that these examples will give you a clear idea of what is required on the Worksheet.

WHAT DOES THIS ALL MEAN AND WHAT DO I DO NOW?

- In this Introduction we have attempted to explain the following:
  - What Job Aids are
  - The classification system (ISD Phases and Blocks) used in the Job Aids
  - Sources of information used in the development of Job Aids
  - Job Aids presently available
  - A description of Flowchart Manuals
  - A description of Job Aid Manuals
- If you feel that you have an adequate understanding of the above, return to the Flowchart Manual now. You will be referred to specific pages in the Resource Manual (the remainder of this document) as you need the information contained in them. Do not attempt to read the Resource Manual now.

RETURN TO THE FLOWCHART MANUAL NOW

JOB AIDS RESOURCE MANUAL

HOW CAN THE RESOURCE MANUAL HELP ME?

The purpose of this resource manual is to assist you in the formation of a data-based system for decision making in the Analysis Phase of the Instructional Systems Development (ISD). In order to make logical and objective decisions based on conditions and needs in the field, you must collect, organize, analyze, and document job significant data (information). Such data includes many specifics under the broad categories of job background data, target population data, and critical task data. The specifications of specific data requirements and sources of this data should be part of the overall Job Analysis Plan.

WHAT ARE SOME SOURCES OF JOB SIGNIFICANT DATA?

There are many sources of data to support a job analysis.

These sources include such things as:

- Technical Manuals
- Field Manuals
- Army Regulations
- Circulars and Phamplets
- Programs of Instruction
- Soldier's Manuals
- Previous Task Lists
- Documentation from the Systems Engineering Era
- Reports from outside agencies, i.e., Army Research Institute, HumRRO, and other military and civilian research organizations
- Internal Research Reports
- Tables of Organization and Equipment and Tables of Distribution and Allowances
- Civilian Publications (technical journals and professional publications)
- Equipment Modification Work Orders
- CODAP (Comprehensive Occupational Data Analysis Programs)
- Field Surveys
- Panels of Experts

WHICH SOURCES OF DATA ARE INCLUDED IN THE RESOURCE MANUAL?

Each of the sources listed is useful for fulfilling specific needs in the Analysis Phase of ISD. The Job Analysis Plan should specify exactly which items of data will be needed and the recommended source(s) for each item. In this way all the data can be accessed and ready for use as soon as it is needed. The last three sources on the list, CODAP, Field Surveys, and Consensus Groups or Panels, are frequently cited in the Job Aids for specific items of information. How to use these sources is the subject of this manual.

CODAP

WHAT IS CODAP?

To provide personnel managers and training managers with the reliable job data needed for job and task analysis, the Deputy Chief of Staff for Personnel has selected the occupational survey questionnaire for data collection and CODAP (Comprehensive Occupational Data Analysis Programs) as the system for processing, reporting, and analyzing this data. The combination of questionnaire and CODAP is currently being used by all the U.S. Armed Forces to support their occupational survey and job analysis efforts. This automated data system provides information in such areas as: duties and tasks performed by job and duty incumbents; types of equipment, tools, and vehicles used and maintained; special skills and knowledge which must be met by job incumbents; quality and quantity of training received or required; physical and mental demands; and special items pertaining to personal and job background information, work environment, and job satisfaction.

WHEN SHOULD CODAP REPORTS BE USED?

Whenever data has already been prepared by CODAP it should be used in preference to school conducted surveys in order to prevent duplication of effort. CODAP has the capability of supplying all your data needs. It is the responsibility of each Army service school to initially provide the Army Occupational Survey Program with the input it must have to supply your job analysis needs, and also to develop a job analysis plan which allows sufficient time to access the necessary data.

Of particular use in job analysis are Group Summary Reports. The Job Aids suggest that you obtain these reports for documenting such information as: tasks performed in each duty position (ask for GPSUM6 report for your MOS), and percentage of soldiers in the skill level performing each task (ask for GPSUM 2).* Given sufficient lead time CODAP can also make up special reports to provide ratings on task selection factors such as, time to train OJE, consequences of inadequate performance, and probability of emergency performance (ask for FACSUM report).

HOW ARE CODAP REPORTS OBTAINED?

In order to obtain CODAP data you should first check with your supervisor to see if the information you need has already been accessed. If it has not, write to:

Commander
US Army Military Personnel Center
ATTN: DAPC-MSP-D
2641 Eisenhower Avenue
Alexandria, VA 22311

or call:

325-9272/9493 (AUTOVON 221-9272/9493).

Allow at least three weeks for the reports to arrive at your school. The necessary lead time could be much longer if you are requesting special information which CODAP has not yet collected. It is recommended that you obtain the two official guides from MILPERCEN: the US Army Military Occupational Data Bank, and the US Army Occupational Survey Program.

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*Keep in mind that these percentages are based on the peacetime conditions in which soldiers are presently being surveyed. Adjustments should be made for combat tasks.

FIELD SURVEYS

WHAT IS A FORMAL FIELD SURVEY?

A formal field survey is similar to the type of questionnaire survey conducted by the Army Occupational Survey Program, only it is conducted by instructional development personnel within an Army service school.

The use of questionnaires permits the job analysis team to make limited contact with large numbers of personnel; thus large amounts of information can be collected at a relatively low cost. Questionnaires can be mailed to personnel who are asked to complete and return them, or they can be administered to groups of job incumbents and/or supervisors by local personnel who have the responsibility and authority to make sure all questionnaires are completed and returned.

WHEN SHOULD FORMAL FIELD SURVEYS BE USED?

Whenever time does not allow you to access information from the Army Occupational Survey Program, an alternate data collection method may be used. Formal field surveys are suggested as an alternate data source in the ISD Job Aids. Should you decide to conduct a formal field survey be sure to obtain permission from MILPERCEN in accordance with the guidelines in AR 600-46.

HOW IS A FIELD SURVEY QUESTIONNAIRE DESIGNED?

- **Types of Questionnaires**

There are two types of questionnaires, the closed form and the open form. We suggest using the closed form, which contains a list of possible items to be selected or blanks to be filled in with words or numbers. (For an example of a closed form questionnaire, see Appendix A.) This form has several advantages over the other alternative, the open form. It is likely to take a minimum amount of time to fill out, thus increasing the chances that it will be completed and returned. The process of tabulating and summarizing responses is simpler and less time consuming than with an open form questionnaire. Machine tabulation and computer analysis of the completed forms are practical when a large number of questionnaires is used.

A properly designed closed form questionnaire is difficult to prepare. The designer must be sure to include all possible responses expected from any of the soldiers who will complete the questionnaire. The items must be constructed on the form so that they clearly communicate to the user exactly what the designer is trying to ask. The greatest single problem with research methods is improperly worded questionnaires, as they produce faulty data. If you intend to design your own questionnaires we suggest consulting the following guides:

Morsh, J.E. and Archer, W.B. *Procedural guide for conducting occupational surveys in the United States Air Force* (PRL-TR-67-11). Lackland Air Force Base, Texas: Personnel Research Laboratory, Aerospace Medical Division, Air Force Systems Command, September 1967.

Jacobs, T.O. *Developing questionnaire items: how to do it well.* Human Resources Research Organization (HumRRO), 300 North Washington Street, Alexandria, Virginia 22314.

WHAT SHOULD BE INCLUDED ON THE QUESTIONNAIRE?

The details of the forms you use will be determined by:

1. how you will tabulate and summarize the results, and
2. what information you wish to collect.

How you will tabulate and summarize results will be determined by whether you have available a computer and other automated data handling equipment and by the number of people surveyed. **To determine what information you wish to collect, you should consider the total data requirement for the training development process. These data requirements should be predetermined in the job analysis plan so that as much information as possible can be obtained in a single questionnaire survey effort.**

One note of caution about the design of your questionnaire is that you should keep the questionnaire as short as practical. In general, the forms should be designed so they can be completed in two hours or less. One way you can save time on a complex task inventory is to list all tasks under their appropriate duty position title. This will permit the soldier to rapidly scan groups of tasks not performed and then proceed to the next duty position.

WHAT TYPE OF INSTRUCTIONS FOR COMPLETING AND ADMINISTERING THE QUESTIONNAIRES SHOULD BE PREPARED?

After the formal field survey questionnaires have been written, the instructions for completing and administering the questionnaires should be prepared. These instructions should include:

- For the user
  - — an introduction explaining the purpose and importance of participating in the field survey.
  - — general instructions explaining how the questionnaire is to be completed.
- For the project officer
  - — general instructions regarding responsibilities.

  (When questionnaire is not self-administered)
  - — specific instructions for administering the questionnaire in a controlled environment.

For examples of these types of instructions, see Appendix B.

HOW IS A SURVEY SAMPLE SELECTED?

You are now ready to select organizations and individuals to provide you with the needed job data. The complexity of the MOS, the availability and quality of published sources of job information, and the number of people in the particular job will determine how much and what kinds of information you need to collect. This will strongly influence the make-up and size of your sample. If the complexity and amount of required data are great, the number of organizations and individuals interviewed will increase. As a general rule, your survey sample should be as large as possible. This is particularly true if you do not have personnel available with the responsibility and authority to assure that most of your questionnaires will be completed. You should make an attempt to obtain a sample that represents the distribution of individuals in the MOS according to command and skill level. Review of personnel records, either by personnel employees, members of your job analysis team, or your field representatives who will conduct the survey will be required to obtain data upon which to base choices for your survey.

- In selecting UNITS for sampling, you should select units that:
    1. have at least a small number of job holders and supervisors who do the particular job to be analyzed. Preferably, you should choose some units that have a relatively small number of job holders, and some that have large numbers.
    2. are geographically and environmentally representative.
- In selecting INDIVIDUALS within the units, you should select a group made up of individuals who:
    1. perform and supervise the job being analyzed
    2. perform with average satisfactory proficiency
    3. are representative in terms of length of time on the job
    4. are representative in terms of training.

For certain types of information you will also want to choose at least a few job holders or supervisors who are acknowledged experts at the job.

HOW IS A QUESTIONNAIRE SURVEY CONDUCTED?

- **Trial Run (Validation of Instruments)**

Before sending out the total number of questionnaires you intend using, you may wish to send out a small number. This will permit you to check the initial results and possibly make some changes in your questionnaires or instructions. Then you will send out what you hope will be the total number of questionnaires required.

- **Group Administration**

The ideal way to administer questionnaires is group administration. Where the local responsible official and his assistants schedule the administration he should do the following:

- Make certain that only eligible individuals are seated in the administration area
- Read the administrative instructions
- Provide any necessary assistance in completing the questionnaires
- Return the completed questionnaires to the school

- **Individual Administration**

Often, particularly with individuals at remote stations, group administration is impractical. In these cases, it is sometimes effective to send the questionnaires to a responsible officer and request that they be returned by a reasonable suspense date. Careful attention should be paid to the instructions for administration or self-administration. If your command has no authority to require that a suspense date be met, then you must either obtain the concurrence of a command with that authority, or be willing to accept a reduced percentage return.

- **Return of Questionnaires**

How much confidence can you have in the validity of your questionnaire if you get less than a 100 percent return? Less and less confidence can be expected with each reduction in the percentage returned. What can you do if you are not satisfied with the percentage of returns of the questionnaires? We suggest you try the following:

1) Send out more forms to different people and hope for better results.
2) Recontact some of the first sample and try to encourage them to return the questionnaires.
3) Visit a random sample of those who did not respond and compare their forced responses with the voluntary responses. Then you and your supervisors will have to decide how much chance you are willing to take that the data you have received presents a sufficiently accurate picture of the job as it really exists.

PANELS

WHAT IS A PANEL OF EXPERTS?

With this method a group of personnel, selected for their experience and knowledge of the job, is brought together to confer about the required job analysis data. Panels may be made up of one or more of the following types of members:

1) Subject Matter Experts (SMEs)

These are personnel found at your school who are acknowledged experts in the tasks, duty positions or MOS you are analyzing. They may be found among instructors or ISD personnel who hold the MOS. SMEs may or may not have had recent field experience.

2) Job Incumbents

This group includes those who are presently holding the jobs/performing the tasks/ you are interested in, or who have recently held the jobs. The more recent the better. More than three years away from the field would disqualify a potential panel member.

3) Job Supervisors

This group includes those who are presently or have recently (within the past three years) supervised soldiers in the jobs/tasks you are interested in.

Job incumbents and job supervisors may be found on the post where your school is located or at other locations. Check the TOEs and TOAs to find out where personnel may be assigned. While personnel assigned to your post are most conveniently assembled, they may not be completely representative of job incumbents/supervisors serving in other locations. Also, they probably have been heavily burdened by school surveys, panels, etc., already due to their proximity to the school. Therefore, personnel from other locations may have to be used.

WHEN IS A PANEL USED?

Panels of experts are a good alternate data source when:

- CODAP is not available
- time and funds are inadequate for conducting a field survey
- the type of information required can be reliably provided by a small group

WHEN ARE SUBJECT MATTER EXPERTS USED?

With this method, a group of highly experienced personnel is brought together to record and organize the required job analysis data. This method is particularly useful in collecting job data on new jobs or on managerial and supervisory jobs where many of the most critical behaviors are not directly observable. Since the members of a panel of SMEs are experts in the MOS being analyzed, their collective effort should be decisions about the requirements of the job. In general, their greatest effectiveness is in evaluating and making decisions about job data that have been collected from other sources by other means.

WHEN ARE RECENT JOB INCUMBENTS AND/OR SUPERVISORS USED?

With this method, a group of job incumbents, job supervisors, or a combination of these, is brought together to provide information about their jobs. The primary function of this type of panel is to provide information about their jobs, not to make decisions. Another name for this type of panel is Consensus Group.

HOW IS A PANEL ASSEMBLED?

The panel is a relatively inexpensive and easy approach to collecting data. Three to seven persons is the number recommended to make up the panel. Whenever possible, you want panel members to be representative of different locations and types of units in the field. While many experts may be available within your school it is critical that their views be balanced by those of persons serving presently or recently in the field. If all of the panel members come from schools, there may be a tendency for the outcome to reflect what exists in training rather than what actually exists on the job.

Appendix A

EXAMPLE OF A CLOSED FORM QUESTIONNAIRE

JOB INVENTORY (DUTY-TASK LIST)	AFSC 921X0/922X0	Page 7 of 44 Pages

1. Check tasks you perform now (✓).
2. Add any tasks you do now which are not listed.
3. In the "Time Spent" column, rate checked (✓) tasks on time spent in your present job.

Time Spent Scale

1 - VERY MUCH BELOW AVERAGE
2 - BELOW AVERAGE
3 - SLIGHTLY BELOW AVERAGE
4 - ABOUT AVERAGE
5 - SLIGHTLY ABOVE AVERAGE
6 - ABOVE AVERAGE
7 - VERY MUCH ABOVE AVERAGE

C. FITTING AND MAINTAINING LIFE RAFTS AND PRESERVERS		✓ CHECK IF DONE IN PRESENT JOB	TIME SPENT DOING THESE TASKS IN PRESENT JOB
1. Clean life preservers	42		
2. Clean life rafts	43		
3. Condemn non-reparable life rafts or life preservers	44		
4. Fit life preservers	45		
5. Inspect life preservers	46		
6. Inspect life raft accessories	47		
7. Inspect life rafts	48		
8. Inspect or weight test carbon dioxide (CO_2) cylinders or cartridges	49		
9. Make entries on or review Life Preserver Data forms (AFTO Form 465)	50		
10. Make entries on or review Life Preserver Inspection Data Record forms (AFTO Form 338)	51		
• • • • • • • • • •			
11. Make entries on or review Life Raft Inspection Record forms (AFTO Form 337)	52		
12. Make entries on or review User Certification Label forms (AFTO Form 27)	53		
13. Pack life preservers	54		
14. Pack life raft accessory containers	55		
15. Pack life rafts	56		
16. Perform functional tests of life preservers	57		
17. Perform functional tests of life rafts	58		
18. Perform inflation tests of life preservers	59		
19. Perform inflation tests of life rafts	60		
20. Perform minor repairs to life preservers such as patching rips, tears, or holes	61		
• • • • • • • • • •			
(Continued next page)			

JOB INVENTORY (DUTY-TASK LIST)	AFSC 921X0/922X0	Page 8 of 44 Pages

1. Check tasks you perform now (✓).
2. Add any tasks you do now which are not listed.
3. In the "Time Spent" column, rate checked (✓) tasks on time spent in your present job.

Time Spent Scale

1 - VERY MUCH BELOW AVERAGE
2 - BELOW AVERAGE
3 - SLIGHTLY BELOW AVERAGE
4 - ABOUT AVERAGE
5 - SLIGHTLY ABOVE AVERAGE
6 - ABOVE AVERAGE
7 - VERY MUCH ABOVE AVERAGE

C. FITTING AND MAINTAINING LIFE RAFTS AND PRESERVERS (CONTINUED)		✓ CHECK IF DONE IN PRESENT JOB	TIME SPENT DOING THESE TASKS IN PRESENT JOB
21. Refill CO_2 cylinders	62		
22. Send life raft compressed gas cylinders to other agencies for test, refill, or inspection	63		
23. Store life rafts or life preservers	64		
IF A TASK THAT YOU PERFORM IS NOT LISTED ANYWHERE IN THE ENTIRE LIST, WRITE IT IN THE BLANK SPACES BELOW.			

Appendix B

ADMINISTRATIVE PROCEDURES
FOR
CLOSED FORM QUESTIONNAIRE

1. Introduction (for user of questionnaire)
2. General Instructions (for user of questionnaire)
3. General Instructions (for project officer)
4. Specific Instructions for Administering Questionnaire (for project officer when questionnaire is administered in a controlled environment.

TO: USER OF QUESTIONNAIRE

INTRODUCTION

TO THE NONCOMMISSIONED OFFICER:

This questionnaire is part of a field survey designed to identify tasks for military police training. Its specific purpose is to obtain from you, the Noncommissioned Officer, information on task criticality and frequency of performance. Feedback gained from this questionnaire will play a major part in redesigning the Noncommissioned Officer Advanced Education System. The ultimate goal is to design training so that it reflects what we have learned from you in the field. This goal is possible only with your full cooperation. Consider each task listed in this questionnaire carefully and give your best response. Your contribution is essential to a successful survey.

TO: USER OF QUESTIONNAIRE

GENERAL INSTRUCTIONS

1. Complete this survey questionnaire within the time specified by your unit project officer and return it to him upon completion.

2. Because instructions for completing each part of this survey questionnaire are different, read all instructions carefully.

3. Part II requires that you supply biographical information. This information will be used to correlate feedback received from the field. Print all answers in the spaces provided on the appropriate survey questionnaire page.

4. In the upper right corner of each page of Part III, Task Inventory, of this survey questionnaire is a BOOKLET NUMBER block. Immediately to the left of this block is the individual booklet number. Print the individual booklet number in the BOOKLET NUMBER block on each page of the Task Inventory as demonstrated in the example.

EXAMPLE:

(000345)

	BOOKLET NUMBER									
	0	1	2	■	4	5	6	7	8	9
	0	1	2	3	■	5	6	7	8	9
	0	1	2	3	4	■	6	7	8	9

5. Part III, Task Inventory, is divided into nine (9) separate sections (Sections I-IX). The content of these sections concerns tasks you may perform in your present duty assignment. You are asked to rate each task in accordance with three criteria - frequency of task performance, immediacy of task performance, and importance of task to mission success.

   Base all selections on your experience in your present duty assignment.

   a. Column A requires that you rate how often you perform each task on a scale from one to four. The criterion for this rating is the frequency of task performance. Those tasks performed most frequently will normally be rated four while those tasks not performed at all will be rated one.

b. Column B requires that you determine how soon you must be capable of performing each task after reporting to your present duty assignment. The criterion for this rating is the immediacy of task performance. Of the four possible responses, select the one most nearly describing your requirements. Select response number four for those tasks which you must be capable of performing immediately upon reporting for duty. Select response number one for those tasks which you never perform.

c. Column C requires that you describe, in your opinion, how important each task is to mission success. The criterion for this rating is the importance of the task to the accomplishment of the unit mission. Those tasks that, in your opinion, are most important to mission success will be rated four while those tasks that you consider least important will be rated one.

6. After selecting, enter your responses for each task, using either a pen or pencil, in the answer portion adjacent to the appropriate task statement as demonstrated in the example.

EXAMPLE: The task PREPARE CORRESPONDENCE, if rated as performed FREQUENTLY in Column A, identified as must be capable of performing IMMEDIATELY in Column B, and determined by you to be MOST IMPORTANT in Column C, would be entered in the answer portion, as shown below.

	1	2	3	4	1	2	3	4	1	2	3	4
PREPARE CORRESPONDENCE	☐	☐	☐	■	☐	☐	☐	■	☐	☐	☐	■

7. After each section of Part III, Task Inventory, is a Write-In Section. These write-in sections are provided in order that you may comment on each task inventory section, or list any task(s) you think should be included in the Task Inventory. These sections also allow you to comment on those tasks that you find are the most difficult for you to perform.

TO: PROJECT OFFICER

GENERAL INSTRUCTIONS FOR PROJECT OFFICER

1. General. The Military Police School is currently involved in redesigning basic military police training to produce military policemen better equipped to perform when they reach the unit. The emphasis is toward training replacements in tasks actually being performed in the field. The questionnaires in this packet are designed to identify those tasks.

   The care with which you, the project officer, administer the questionnaires will determine the accuracy of field feedback and, consequently, the success or failure of this project.

2. Survey Packet Contents.
   - a. Questionnaire
   - b. Supervisor Questionnaire
   - c. Project Officer Instructions
   - d. Answer Sheets for Questionnaire
   - e. Pencils for use on answer sheets.

3. Responsibilities.
   - a. Unit Commander. The unit commander is requested to appoint a project officer and to monitor administration of the survey.
   - b. Project Officer. The project officer is responsible for the control and handling of questionnaires, for the administration of the questionnaires, and for returning completed and unused questionnaires to the Military Police School.
   - c. Questionnaire Administrator. The project officer may appoint someone to administer the questionnaire, if necessary. Normally, however, it is recommended that the project officer administer the questionnaire himself.

4. About the Questionnaires.
   - a. Questionnaire. This questionnaire is designed to identify tasks being performed by military policemen in the field and the frequency with which each task is performed.
   - b. Supervisor Questionnaire. The supervisor questionnaire is programmed to provide feedback on task criticality, probability of deficient performance, and the frequency with which each task is performed.

5. Who Takes The Questionnaire. The project officer is responsible for selecting individuals to take the questionnaires (respondents) within their units. Those selected must meet the requirements listed below:

a. The questionnaire respondent must:

(1) Be in an M.P. duty assignment (actually performing M.P. duties)

(2) Have been on the job at least 90 days

b. The respondent to the Supervisor Questionnaire must:

(1) Command or supervise M.P. personnel

(2) Have been in a command or supervisory position in the unit for 90 days. (Assign questionnaires proportionately among officers and NCO's.)

6. Questionnaire Administration.

a. Questionnaire. The questionnaire will be administered in a controlled environment. Persons participating in the survey will be allowed two hours to complete the questionnaire and will turn the questionnaire and answer sheets in to the questionnaire administrator prior to leaving the survey area. Individual questionnaires and their accompanying answer sheets will be kept together.

See attached item for the procedure to be followed in administering the questionnaire.

b. Supervisor Questionnaire. Supervisors selected as respondents for this questionnaire will be allowed to sign for the questionnaire and take it with them. They will complete the questionnaire and return it to the project officer within a time frame he specifies. This time frame must be compatible with the suspense date to the Military Police School.

7. Questionnaire Handling. Questionnaires and answer sheets become FOR OFFICIAL USE ONLY when completed. For ease of accounting, each questionnaire and its accompanying answer sheets are numbered. All questionnaires must be returned to the Military Police School whether they are used or not. Instructions for returning the questionnaires to the Military Police School are contained in the basic letter. If you have any problems or questions, contact (NOTE: Give name or names, address, and telephone number).

TO: PROJECT OFFICER ADMINISTERING QUESTIONNAIRE IN A CONTROLLED ENVIRONMENT

ADMINISTERING THE QUESTIONNAIRE

A-1. Preparation. A classroom or training room equipped with desks will provide the most ideal site for administering the questionnaire. Questionnaires, answer sheets, and two electrographic pencils should be issued to participants after everyone who is to take the questionnaire has arrived. This ensures that everyone starts together.

A-2. Instructions. The questionnaire administrator will present the following instructions.

a. "Is there anyone here who is not working in an M.P. duty position? Is there anyone here who has not been assigned to their present duties at least 90 days? If so, please leave at this time."

b. "Will everyone at this time please read the first page in the questionnaire which has been issued to you."

(Note to the administrator: It must be emphasized that your enthusiasm for this project or lack of it will be contagious. It is important that you demonstrate a positive attitude to the participants. Allow time for the first page to be read and underline the importance of the questionnaire with the following statement.)

"I would like to stress the importance of this questionnaire. The Military Police School wants to design training to fit the job in the field. You are the only people who can tell them what they need to know. Please think through each question and give your best answers."

c. "Turn to Part I, Biographical Information, and answer questions 1-13. When you have finished, lay your pencil on the desk so I will know when to proceed to the next step."

d. "Now read the instructions found in Part II."

(Note to the administrator: Allow reasonable time for everyone to finish before moving to the next step.)

"Are there any questions?"

e. "As you read in the instructions, there are nine answer sheets accompanying your questionnaire. Take the answer sheets and number them one through nine to correspond to the first nine sections in Part III of the questionnaire. If you do not have nine answer sheets, raise your hand—I have extra ones. Use a separate answer sheet for each section. Answer only the number of questions listed in each and move to the next section and answer sheet. It is not necessary to write your name, rank, the date, or course at the top of the answer sheet. Also, disregard the blocks marked score, grade, extra points, and social security number."

f. "Because of the size of this survey, these answer sheets will be read by machine. You must use the special pencils provided so that the machine can read the answers. When marking your answer, take care to fill the vertical rectangle outlining the letter as shown by the example on page 4 of the instructions. Also, please be sure not to make any stray marks on the answer sheets. Finally, do not fold the answer sheets."

g. "All answers must be based on your experience in this your present unit. Do not call on experience in previous units. This means that if you do not perform a particular task in your present unit, you must mark 'do not perform this task' on your answer sheet."

h. "You may begin answering Part III. Remember Section ten, the written section. When you finish answering all questions, insert your answer sheets into the questionnaire and turn them in to me. You may leave when you are finished. Are there any questions?"

A-3. Conclusion. After everyone has taken the questionnaire, ensure that all questionnaires and answer sheets are accounted for. Collect the pencils provided so that they may be returned to the Military Police School along with the questionnaires and answer sheets.

JOB AID FOR
DEVELOPING OBJECTIVES

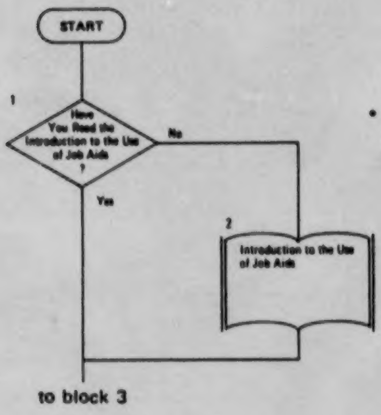
ISD II.1

Manual

This is the 5th in a series of ISD Job Aids for use in instructional design and development. This volume is to be used as a supplement to the primary document, "Job Aids: Descriptive Authoring Flowcharts ISD II.1 Develop Objectives." The flowchart document will direct you to specific guidance, examples, and references provided in this volume. If you do not have the primary flowchart document, request it from your supervisor.

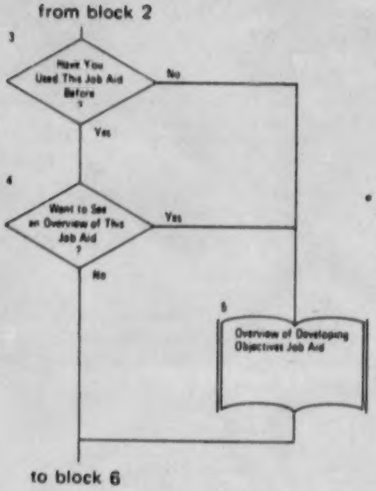
The wording in this manual should not be construed to discriminate between the sexes. In order to avoid a repetitious use of the terminology, "he/she," the terms, "he," "him," and "his," as well as "men," are intended to include both the masculine and feminine gender. Any exceptions to this usage will be so noted.

ISD II.1 DEVELOP OBJECTIVES


START
1
Have You Read the Introduction to the Use of Job Aids ?
No
Yes
2
Introduction to the Use of Job Aids
to block 3

- This introduction provides the user with instruction on the basic structure of the Job Aids and guidance for their use.

- Refer to Introduction.


from block 2
3
Have You Used This Job Aid Before ?
No
Yes
4
Want to See an Overview of This Job Aid ?
Yes
No
5
Overview of Developing Objectives Job Aid
to block 6

- Overview includes:
  - Goal
  - Objectives
  - Products
  - Major steps in process
  - Worksheets used
  - Descriptive flowchart

- For detailed overview, see below.

What is the Job Aid for "Develop Objectives" all about?

- **GOAL**

  — The purpose of this job aid is twofold. First, it will guide you in the actual writing of correctly stated learning objectives. Second, it will explain the mechanics of deriving learning objectives from Task Summary Sheets by means of learning analysis.

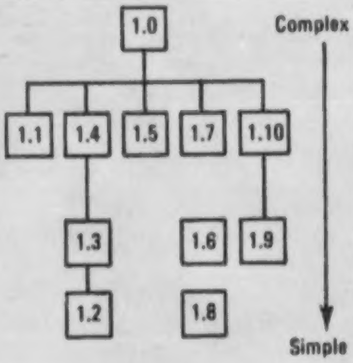
  NOTE THAT LEARNING ANALYSIS IS DIFFERENT FROM TASK ANALYSIS.

  — Performing a task and learning to perform a task are two different things. Details of how a task is performed, from the first step to the last, have already been carefully documented in the products of ISD I.3 (the Task Analysis Work-Sheet and the Task Summary Sheet). In order to design instruction to train soldiers to perform the tasks on the job, it is necessary to translate TASKS into TERMINAL LEARNING OBJECTIVES (TLOs) and task ELEMENTS, and certain enabling SKILLS and KNOWLEDGES, into LEARNING OBJECTIVES (LOs). All of these learning objectives (both TLOs and LOs) describe what a soldier must be able to do during and at the completion of training.

  — Thus the task analysis describes the task in its on-the-job performance sequence, while the learning analysis describes the task in its complexity sequence. In learning analysis, the most complex skill, the task itself is broken down into all its simpler skills until the entry level skills of the target population are reached. (Entry level skills are skills which the trainees already possess and therefore do not require training.)

  — Later, in ISD II.4, Sequence and Structure Objectives, the order in which the learning objectives are most easily learned is determined.

— Summary of the differences between these three steps.

ISD Block	I.3 Conduct Task Analysis	II.1 Develop Objectives	II.4 Sequence and Structure Objectives
Analysis Task of Based on:	Performance Sequence	Partial Learning Sequence	Complete Learning Sequence
TLO	1.0 Lubricate fittings on car	 1.0 Complex 1.1 1.4 1.5 1.7 1.10 1.3 1.6 1.9 1.2 1.8 Simple	1.0 Lubricate fittings on car
LO	1.1 Assemble equipment		
LO	1.2 Use fittings chart		Group One Objectives
LO	1.3 Identify fittings		1.2
LO	1.4 Locate fittings		1.3
LO	1.5 Clean fittings		1.4
LO	1.6 Operate lube gun		
LO	1.7 Charge fittings		Group Two Objectives
LO	1.8 Wipe fittings		1.6
LO	1.9 Clean lube gun		1.8
LO	1.10 Replace equipment		1.7
		SHORTHAND PYRAMID	1.9
		DERIVED BY LEARNING	
		ANALYSIS	Group Three Objectives
			1.1
			1.10

- **OBJECTIVES**

1) Given a list of task statements, translate them into correctly stated terminal learning objectives with their enabling learning objectives.

2) Given the appropriate worksheets, document for each task the enabling skills and knowledges derived by learning analysis, and the learning objectives needed to train the task.

- **WORKSHEETS USED**

  — Examples of worksheets used in this block can be found as follows:

  1) Learning Objectives Documentation Sheet, shown on page E-7.
  2) 3" x 5" Learning Pyramid cards, shown on page E-8.
     The Shorthand Pyramid, which displays the learning analysis, may be developed and shown on any large sheet of paper. We suggest using newsprint, or butcher paper, about 2 feet x 3 feet. Each task element and each enabling skill and knowledge is written in short form (action statement only), on the 3 x 5" cards provided with this job aid and taped on the large sheet of paper. In this way it can be changed if needed as the pyramid develops. (If space permits, the cards can be arranged on a table top or bulletin board. They are easier to work with when not taped down.)

- **DESCRIPTIVE FLOWCHART**

  — The flowchart on pages E-79 and E-80 shows the steps in the use of the job aid for developing objectives. The flowchart will be useful to you in getting a clear picture of the overall process used in this job aid. A more completely described flowchart is provided in Job Aids: Descriptive Authoring Flowcharts ISD II.1 Develop Objectives pages E-3 thru E-13.

Example (Partially Completed)

ISD II.1 Develop Objectives

LEARNING OBJECTIVES DOCUMENTATION SHEET

(LOD Sheet)

SECTION I

Name/Office Symbol SFC Albert Johnson Date 11/30/78

Course Land Navigation Skills

SECTION II

Task ID No 330-575-1008 Institution

TERMINAL LEARNING OBJECTIVE

Action Statement the trainee will hike from point A to point B

Conditions Statement given a map, compass and hiking pack

Standards Statement within 3 hours

SECTION III

(A) Element/Enabling Skills and Knowledges	(B) Learning Objective Required?	(C) Learning Objective (Action, Conditions & Standards)	(D) Learning Category/ Sub Category	(E) Group Letter Sequence Number
1 A Orient map and compass	1008 A	Given a map and a compass in unfamiliar terrain, the trainee will orient the map according to magnetic North	M/rule learning + using	
2 A.1 Interpret map	1008 A.1	When located in unfamiliar terrain, the trainee will select the correct map for the terrain from a group of 5 maps	M/rule learning + using	
3 A.1.1 Use legend	1008 A.1.1	When located in unfamiliar terrain, the trainee will point out 5 actual terrain features which correspond to the map symbols	M/classifying	
4 A.1.1.1 Match symbols to actual terrain	1008 A.1.1	Given a series of photos of actual terrain features, the trainee will sort them into groups under the appropriate symbol	M/discriminating	
5 A.1.1.2 Match symbols to legend	1008 A.1.1.2	Given a map, the trainee will match the symbols to the map legend by drawing connecting lines from the symbol to the legend	M/identifying objects + symbols	
6 A.1.1.1.1 Identify symbols	1008 A.1.1.1	Given 12 examples of map symbols, state what the symbols indicate. All 12 must be identified correctly.	M/identifying objects + symbols	
7 A.1.1.1.1.1 Identify colors	none			
8 A.1.1.1.1.2 Identify shapes	none			
9 A.2 Use compass	1008 A.2	Given a compass in unfamiliar terrain, the trainee will determine the directions: North, East, South and West, from his location	M/rule learning + using	
10				
11 A.2 enabling skills and Knowledges not shown				
12				
13				
14 B Hike with pack	1008 B	Given a 40 lb backpack, the trainee will hike non-stop from point A to point B within 3 hours	P/gross motor skill	

White LP Card
(Example)

Task #__________________________________

Instructional Setting__________________________

Learning Objective #__________________________

Group Letter________

Sequence #________

Action Statement:

Yellow LP Card
(Example)

Task #__________________________________

Element/Enabling S&K #________________________

Learning Category/Subcategory____________________

Learning Objective #__________________________

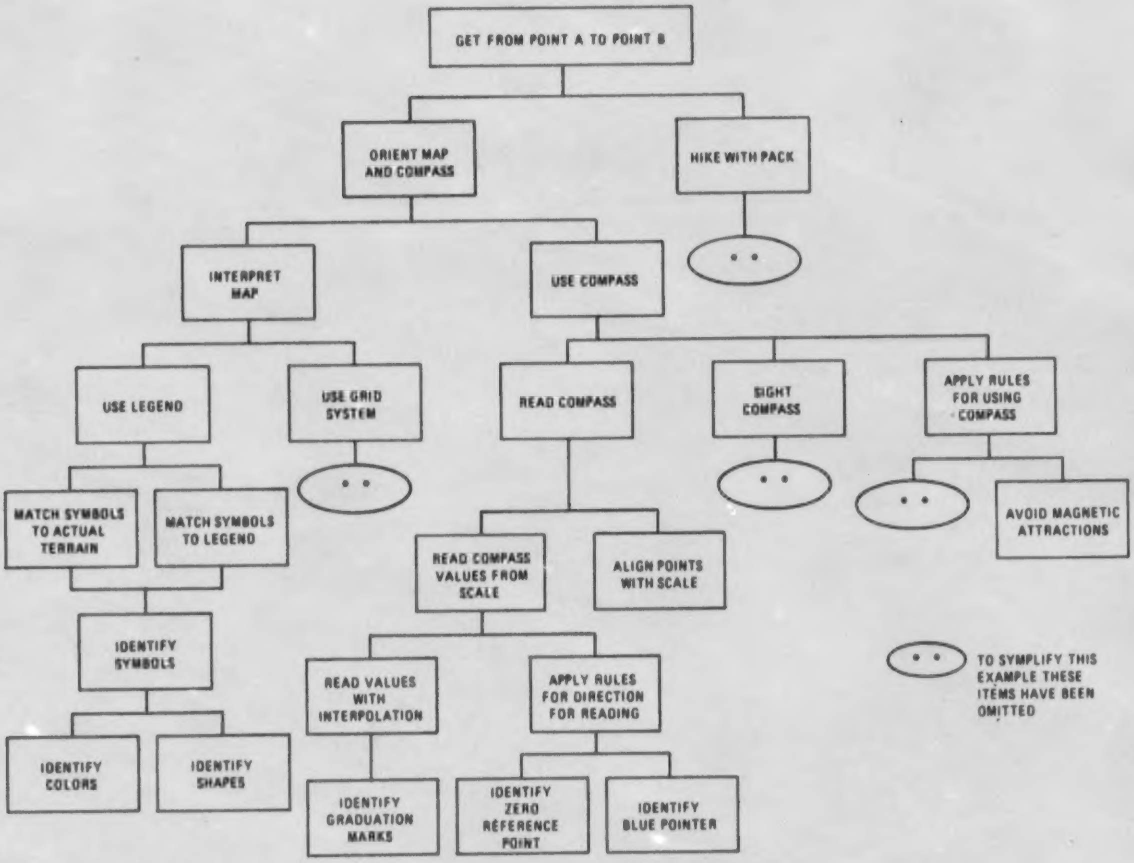
Group Letter________

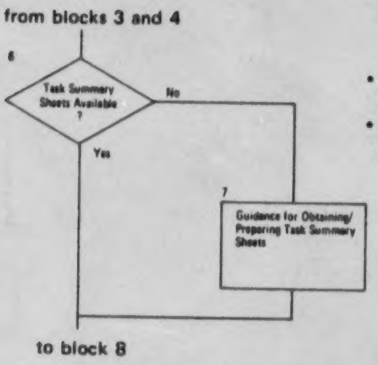
Sequence #________

Action Statement:

Example:

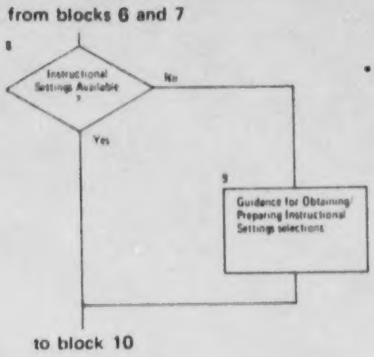
SHORTHAND PYRAMID (Learning Analysis)


GET FROM POINT A TO POINT B
ORIENT MAP AND COMPASS
HIKE WITH PACK
INTERPRET MAP
USE COMPASS
USE LEGEND
USE GRID SYSTEM
READ COMPASS
SIGHT COMPASS
APPLY RULES FOR USING COMPASS
MATCH SYMBOLS TO ACTUAL TERRAIN
MATCH SYMBOLS TO LEGEND
AVOID MAGNETIC ATTRACTIONS
READ COMPASS VALUES FROM SCALE
ALIGN POINTS WITH SCALE
IDENTIFY SYMBOLS
READ VALUES WITH INTERPOLATION
APPLY RULES FOR DIRECTION FOR READING
IDENTIFY COLORS
IDENTIFY SHAPES
IDENTIFY GRADUATION MARKS
IDENTIFY ZERO REFERENCE POINT
IDENTIFY BLUE POINTER
TO SYMPLIFY THIS EXAMPLE THESE ITEMS HAVE BEEN OMITTED


from blocks 3 and 4
6
Task Summary Sheets Available ?
No
Yes
7
Guidance for Obtaining/ Preparing Task Summary Sheets
to block 8

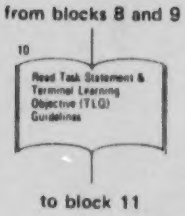
- This question asks: Do you have the Task Summary Sheets for all the tasks for which you are developing objectives?
- Task Summary Sheets are made up for each task presented in the Soldier's Manual (SM). They are direct translations of the Task Analysis Worksheets into SM format.

- Task Summary Sheets should be available as output from ISD I.3 Conduct Task Analysis, or in the Soldier's Manual.
- If procedures for preparing Task Summary Sheets were not complete, go to Job Aids: Descriptive Authoring Flowcharts, page B-1.
- When Task Summary Sheets have been obtained, return to Block 6.


from blocks 6 and 7
8
Instructional Settings Available ?
No
Yes
9
Guidance for Obtaining/ Preparing Instructional Settings selections
to block 10

- This question asks Do you know the instructional setting for each task?

- Instructional settings should be available as out put from ISD I 5 Select Instructional Setting
- If procedures for selecting instructional settings were not complete, go to Job Aids Descriptive Authoring Flowcharts, page D 1 (Instructional settings are also listed in the Commander's Manual)
- When instructional settings have been obtained, return to Block 8


from blocks 8 and 9
10
Read Task Statement & Terminal Learning Objective (TLO) Guidelines
to block 11

- Guidelines give an explanation of the relationship between the task statement and its terminal learning objectives (TLO).
- For further explanation, see below.

What is the relationship between a task statement and its terminal learning objective (TLO)?

- Both task statements and TLOs consist of the same three parts:

Conditions Statement	Action Statement	Standards Statement
Description of the condition(s) of performance—What is presented to the soldier	Description of the action or behavior—What the soldier is expected to do	A statement of the output or outcome of the performance and the standard(s) of performance

- The terminal learning objective may be identical to the task statement or it may be a modified version, depending upon how practical it is to obtain on-the-job performance in the training setting. The following discussion of the levels of objectives will clarify this point.

- **LEVELS OF OBJECTIVES:** Objectives can be written at several different levels. It's important to understand what these levels are because they are the basis of test and course development. Understanding these levels can also help you judge the adequacy of the objectives.

  - Level 1 Objectives = Task Statements

    Level 1 objectives tell what must be done on the job. These are the actual task statements prepared by the job/task analyst in the Job Analysis phase, ISD I.1. Statements of the critical tasks, selected for training in ISD I.2, are the inputs to this job aid.

  - Level 2 Objectives = Terminal Learning Objectives (TLOs)

    Level 2 objectives are essentially Level 1 objectives which may be modified to match the training resources and safety requirements. Level 2 objectives tell what a soldier must be able to do at the end of training, not necessarily in an operational environment (on-the-job). TLOs are outputs of this job aid.

  - Level 3 Objectives = Learning Objectives (LOs)

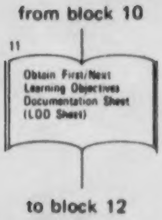
    Level 3 objectives refer to the enabling skills/knowledges for the whole task, which are not directly useful by themselves. These are translated from the task elements and certain skills/knowledges which must be learned in order to perform the elements. Thus, Level 3 objectives tell what a soldier must do and know (skills and knowledges) as a prerequisite for doing Level 2 objectives. LOs are also outputs of this job aid.

- Thus, in many cases the TLO and the task statement will be identical because the tasks themselves can be duplicated in the training environment. In these cases there is no need to write a new TLO, the task statement is the TLO

- In other cases, only portions of the actual required behavior, conditions, and standards from the job world can be represented in the school setting. Then the behavior, and/or conditions and/or standards may require revision to make them compatible with the training environment.

- In still other cases, the terminal learning objectives (TLOs) will represent the behavior accurately, but will not require the ultimate level of proficiency that is required on the job. In many troubleshooting, maintenance, and repair tasks, job conditions require speed and proficiency which cannot readily be achieved in school. It is expected that these high levels of speed and proficiency will be achieved on the job after initial school training.

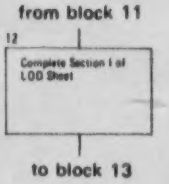
- Thus, when any portion of the task statement must be changed to meet the requirements/limitations of the training situation, your aim is to provide practical, high fidelity measurement alternatives, (TLOs which approximate the task as nearly as possible).


from block 10
11
Obtain First/Next Learning Objectives Documentation Sheet (LOD Sheet)
to block 12

- The Learning Objectives Documentation Sheet is used in this block to record
  - the terminal learning objective (TLO) for a task.
  - all task elements and enabling skills and knowledges (S&K) determined by learning analysis process.
  - all the learning objectives (LOs) for the TLO.
  - learning categories/subcategories.
- Column E will be completed in ISD II.4, sequence and structure objectives.
- For guidance on obtaining the LOD Sheet, see below.

Where can I obtain a Learning Objective Documentation Sheet?

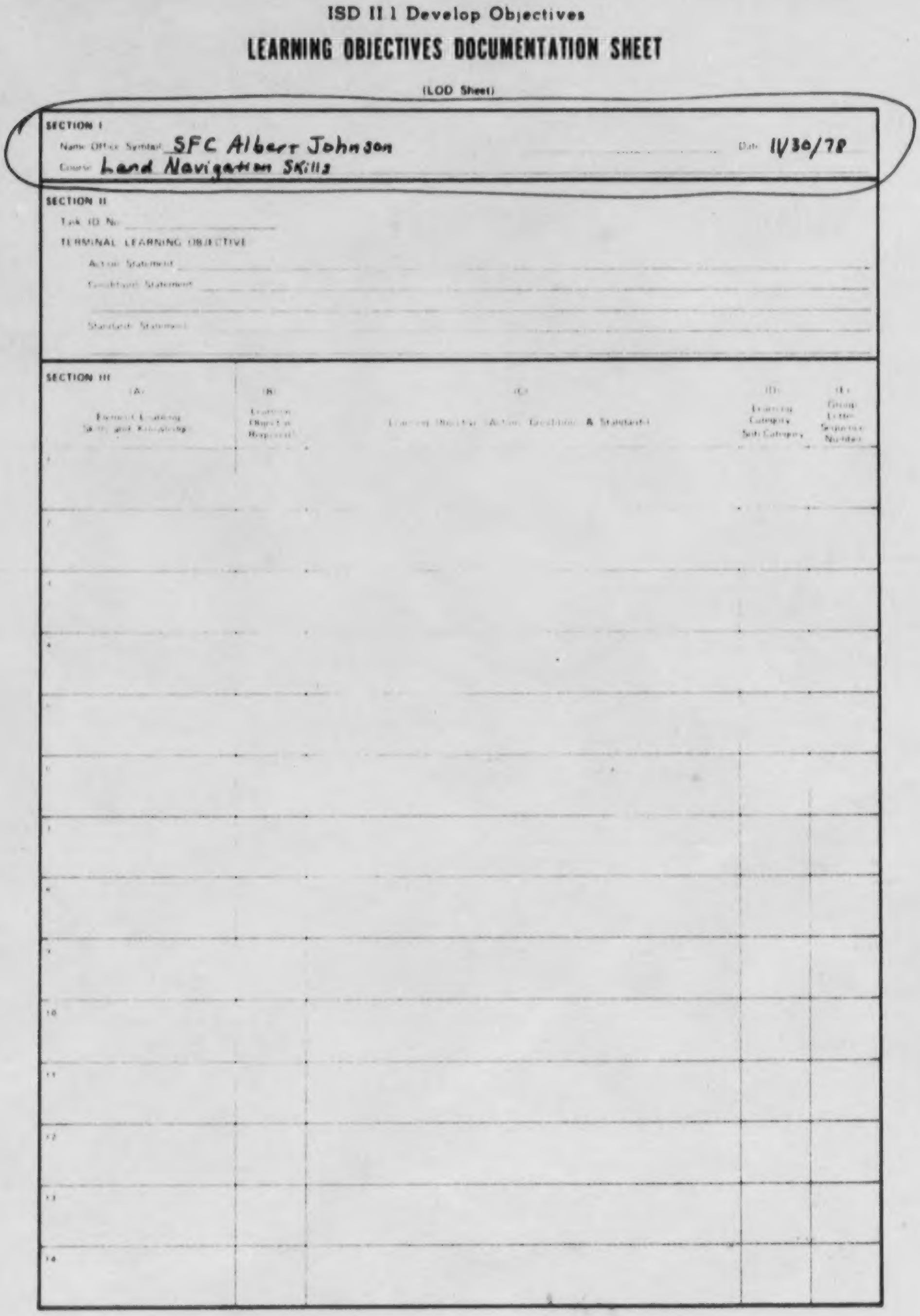
- LOD Sheets are available for duplication in the pocket at the back of this manual.
- To see an example of a partially completed LOD Sheet, refer to page E-7.


from block 11
12
Complete Section I of LOD Sheet
to block 13

- Section I includes the following identifying information.
  - Name/Office Symbol
  - Date
  - Course
- For example, see below.

What does the Learning Objective Documentation Sheet look like when Section I has been completed?

EXAMPLE:



ISD II.1 Develop Objectives

LEARNING OBJECTIVES DOCUMENTATION SHEET

(LOD Sheet)

SECTION I

Name/Office Symbol SFC Albert Johnson Date 11/30/78

Course Land Navigation Skills

SECTION II

Task ID No. ____________

TERMINAL LEARNING OBJECTIVE

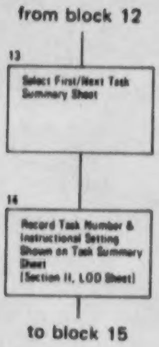
Action Statement ____________

Condition Statement ____________

Standards Statement ____________

SECTION III

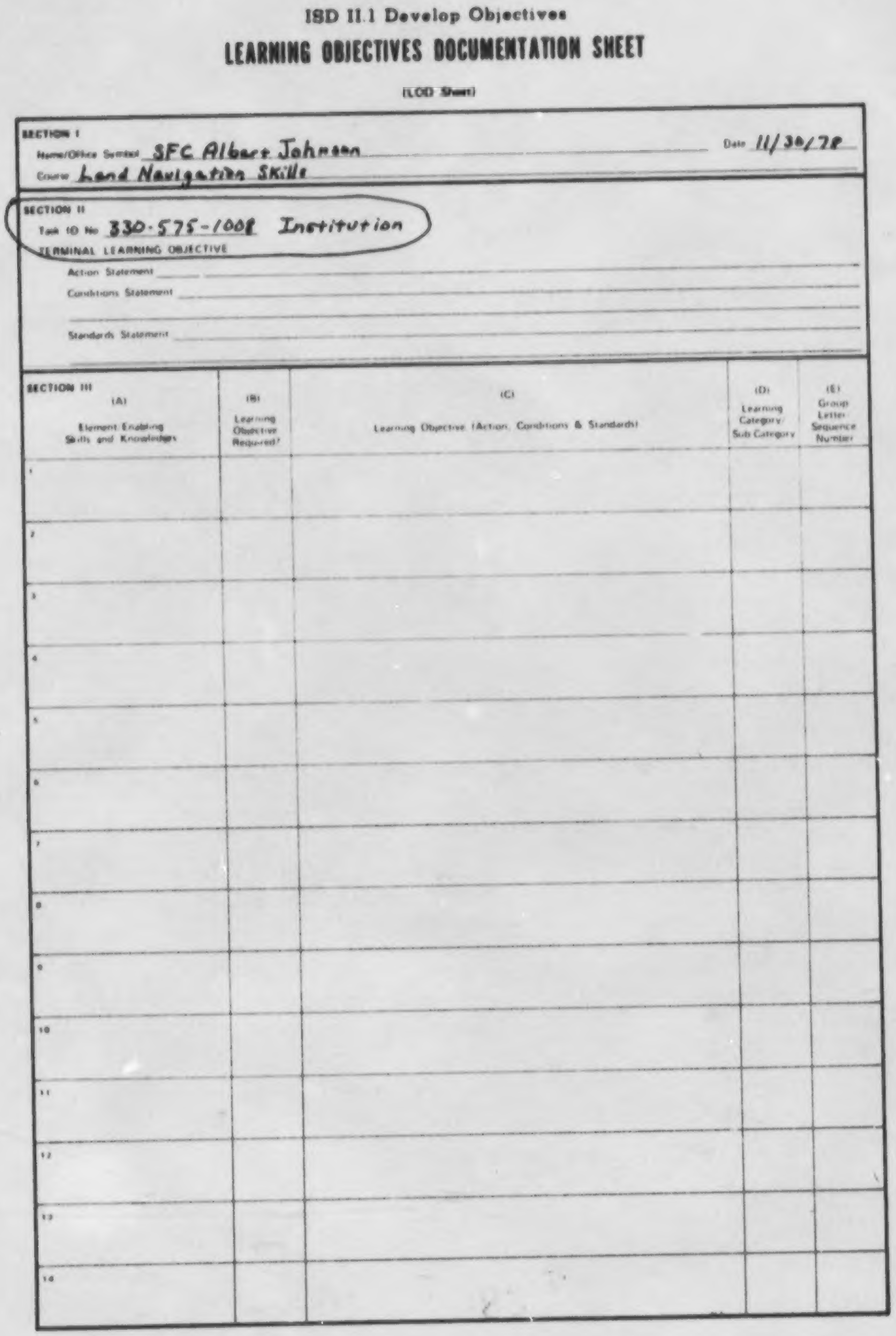
(A) Element Learning Skills and Knowledge	(B) Learning Objective Required?	(C) Learning Objective (Action, Condition & Standard)	(D) Learning Category Sub Category	(E) Group Letter Sequence Number
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				


from block 12
13
Select First/Next Task Summary Sheet
14
Record Task Number & Instructional Setting Shown on Task Summary Sheet (Section II, LOD Sheet)
to block 15

- For example, see below.

What does LOD Sheet look like when task number and instructional setting are recorded in Section II?

EXAMPLE:



ISD II.1 Develop Objectives

LEARNING OBJECTIVES DOCUMENTATION SHEET

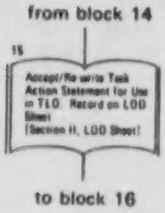
(LOD Sheet)

SECTION I
Name/Office Symbol SFC Albert Johnson Date 11/30/78
Course Land Navigation Skills

SECTION II
Task ID No 330-575-1008 Institution
TERMINAL LEARNING OBJECTIVE
Action Statement
Conditions Statement
Standards Statement

SECTION III

(A) Element Enabling Skills and Knowledges	(B) Learning Objective Required?	(C) Learning Objective (Action, Conditions & Standards)	(D) Learning Category/ Sub Category	(E) Group Letter Sequence Number
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				


from block 14
15
Accept/Re-write Task Action Statement for Use in TLO. Record on LOD Sheet
(Section II, LOD Sheet)
to block 16

- For guidance in determining whether the task action statement is acceptable as a TLO action statement, see below. Manual also provides guidance for re-writing action statement when necessary.

How do I decide whether to accept or rewrite the task action statement for the TLO?

- Look only at the action statement of the task, (conditions and standards statements will be considered separately). Is this an action which could be performed in a training setting? If so, accept the action statement for the task as the action statement for the TLO. If this action could not be performed as stated in the training setting you must modify it. (This would be very unusual since most actions could be performed in the training environment with modification of only the conditions and standards).

- For example, you could accept this action statement: Load, reduce a stoppage, unload, and clear an M60 machine gun.

  You could not accept this one:

  > Shoot known enemy personnel.

  This statement would have to be modified.

- If you decide to rewrite the action statement, study the following guidelines:

- The ACTION statement tells what the trainee does.

  — Every objective (whether TLO or LO) should state precisely what the trainee must do. The statement of performance must be clear enough for that performance to be trained and tested. Examples of performances stated in objectives are:

    - Climb the telephone pole
    - Disassemble an M-16 rifle
    - State conditions for which a tourniquet should be applied
    - Camouflage the helmet
    - Add two five-digit numbers.

---

1) Use an action verb

Note in the examples on the previous page that every statement of performance includes an action verb. This verb usually is the key to the performance. It tells what must be done. For example, in the statement of performance, "State conditions for which a tourniquet should be applied," the action verb is "State." You can test a soldier's ability to state these conditions. Suppose that the statement of performance had read, "Understand the conditions for which a tourniquet should be applied." Would you know what to test? How would you know when a student "Understands" the conditions? By using an action verb the performance becomes both measurable and observable.

2) Clarify main intent if necessary by using an indicator. Sometimes the action verb is not the key to the performance to be trained and tested. It may be only the indicator of the performance. Any time that you can't point to the performance itself, the action verb should specify the appropriate indicator of that performance. For example, consider the statement of performance "Add two five-digit numbers." It is clear that the performance called for is "adding." But how do you know when someone successfully adds two numbers? Obviously, an indicator must be supplied, since you can't observe the act of adding. So you would attach an indicator to the statement of performance; i.e., "Add two five-digit numbers and write the answer in the space below." Note that although "write . . ." is the observable action, the main intent of the performance is adding, not writing. If the statement of performance calls for an action (has a main intent) that is not directly observable, an appropriate indicator must be added.

3) Select verbs which reflect the type of learning, i.e., Mental, Physical or Attitudinal

When the expected performance has been successfully analyzed into the proper types of learning, you can indicate clearly what it is that the trainee is to do. These indications require precise statements. Each action statement can contain two verbs. The first may indicate the kind of objective that is being written (see examples on the next page) and the second will indicate how the trainee will perform the action indicated. The exception occurs when there can be no confusion: "Sing the Star Spangled Banner." But, "Describe the relationship between . . ." could easily mean either orally or in writing. So, if there can be any doubt about the intention, use a second verb to indicate what the trainee is to do.

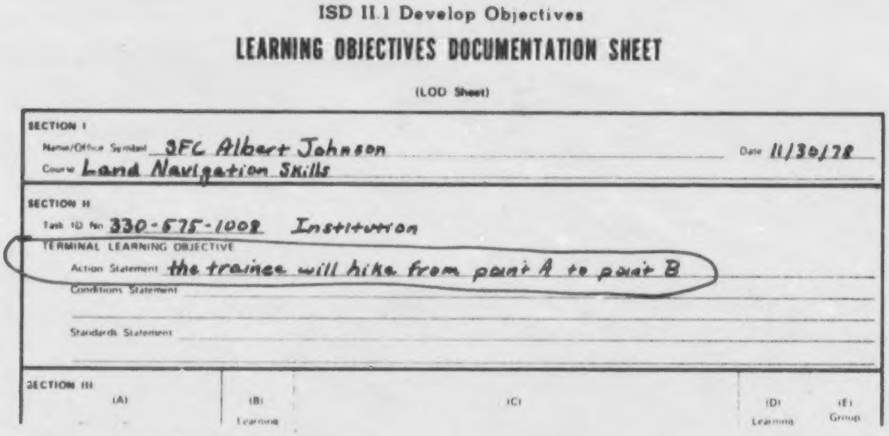
Examples of Suitable Verbs for Each of the Three Types of Objectives

Mental Skill	Physical Skill	Attitude
State	Execute	Choose
Name	Operate	Volunteer
Recite	Repair	Allow
Describe	Adjust	Recommend
List	Manipulate	Defend
Tell	Handle	Endorse
Write	Manufacture	Cooperate
Demonstrate	Calibrate	Accept
Discriminate	Remove	Decide to
Classify	Replace	Agree
Generate (a solution)		
Apply (a rule)		
Solve		
Derive		
Prove		
Analyze		
Evaluate		

- More guidelines for writing action statements are given in block 40 of this job aid.

What does the LOD Sheet look like when the TLO action statement has been recorded?

EXAMPLE:



ISD II.1 Develop Objectives

LEARNING OBJECTIVES DOCUMENTATION SHEET

(LOD Sheet)

SECTION I

Name/Office Symbol SFC Albert Johnson Date 11/30/78

Course Land Navigation Skills

SECTION II

Task ID No 330-575-1008 Institution

TERMINAL LEARNING OBJECTIVE

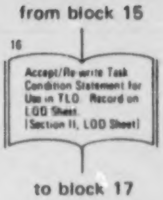
Action Statement the trainee will hike from point A to point B

Conditions Statement

Standards Statement

SECTION III

(A) (B) Learning (C) (D) Learning (E) Group


from block 15
16
Accept/Re-write Task Condition Statement for Use in TLO. Record on LOD Sheet.
(Section II, LOD Sheet)
to block 17

- For guidance in determining whether the task conditions statement is acceptable as a TLO conditions statement, see below. Manual also provides guidance for re-writing conditions statement when necessary.

How do I decide whether to accept or rewrite the task condition statement for the TLO?

- Look at the TLO action statement you have just recorded. Could the conditions stated for the task be duplicated in the training environment for the TLO action?

  For example:

TLO/Task Action:	Load, reduce a stoppage, unload, and clear an M60 machine gun.
Task Conditions:	Given an assembled and cleared M60 machine gun, and any amount of linked caliber 7.62mm ammunition, and a requirement to expend all rounds in the belt.

  TLO conditions may have to be modified in this case as follows:

  > Given an assembled and cleared M-60 machine gun, and any amount of linked caliber 7.62mm dummy rounds ammunition, and a requirement to expend all rounds in belt.

- If you decide to rewrite the conditions statement, study the following guidelines:

- The CONDITIONS statement tells all of the conditions and limitations which affect the performance.

  - This portion of the learning objective describes the important aspects of the performance environment. What does the trainee have to work with? Can he select his own tools? Are technical orders or checklists available as a starting point? The conditions portion of the learning objective should specify the objects, events, words, or symbols which will be presented to the trainees. Consider the instructional setting when determining conditions as they will indicate what is available.

  - A terminal learning objective (TLO) or learning objective (LO) may require more than one statement of condition in order to secure the desired action. On the other hand, in some cases the condition may be implied, as in the case of "Recite the Gettysburg Address," the condition "from memory" may be omitted since it is implied by the verb "recite."

Sample Statements of Conditions are Shown Below:

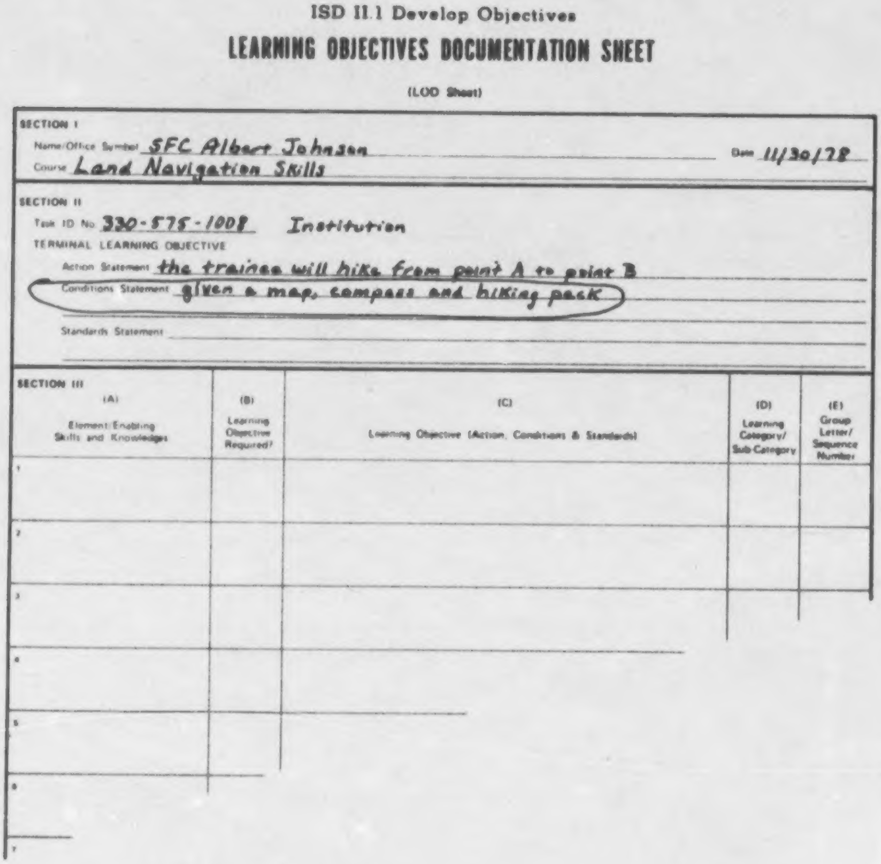
Sample Statement of Training Conditions

GOAL	EXAMPLE
State the conditions imposed upon the trainee.	"Given the diameter of a sphere and the appropriate formula, compute the surface area of the sphere. The trainee does not have to memorize or derive the formula. He solves the problem using the formula provided.
Do not overuse the word "given." Use variations.	"Field-strip and assemble an M-16A1 rifle under conditions of total darkness." This implies that the trainee will be provided with the rifle, and requires that he strip and assemble the weapon in complete darkness.
Establish the working conditions.	"Using available library resources prepare a staff study comparing the communications support contributions made by five military leaders during the nineteenth century."

- More guidelines for writing conditions statements are given in block 42 of this job aid.

What does the LOD Sheet look like when the TLO conditions statement has been recorded?

Example:



ISD II.1 Develop Objectives

LEARNING OBJECTIVES DOCUMENTATION SHEET

(LOD Sheet)

SECTION I

Name/Office Symbol SFC Albert Johnson Date 11/30/78

Course Land Navigation Skills

SECTION II

Task ID No 330-575-1008 Institution

TERMINAL LEARNING OBJECTIVE

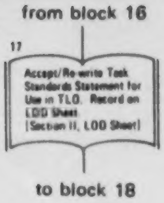
Action Statement the trainee will hike from point A to point B

Conditions Statement given a map, compass and hiking pack

Standards Statement

SECTION III

(A) Element/Enabling Skills and Knowledges	(B) Learning Objective Required?	(C) Learning Objective (Action, Conditions & Standards)	(D) Learning Category/ Sub-Category	(E) Group Letter/ Sequence Number
1				
2				
3				
4				
5				
6				
7				


from block 16
17
Accept/Re-write Task Standards Statement for Use in TLO. Record on LOD Sheet.
(Section II, LOD Sheet)
to block 18

- For guidance in determining whether the task standards statement is acceptable as a TLO standards statement, see below. Manual also provides guidance for re-writing standards statement when necessary.

How do I decide whether to accept or rewrite the task standards statement for the TLO?

- Look at the TLO action and conditions statement you have just recorded. Are the standards given for the task realistic and achievable for the TLO action and conditions in the training environment?

  For example:

  TLO Action: Load, reduce a stoppage, unload, and clear an M60 machine gun.

  TLO Conditions: Given an assembled and cleared M60 machine gun and any amount of linked caliber 7.62mm dummy rounds ammunition, and a requirement to expend all rounds in the belt.

  Task Standards: Load and clear weapon within 5 seconds.

  TLO standards may have to be modified so that they are achievable by the new trainee. You may want to modify as follows:

  TLO Standards: Load and clear weapon within 10 seconds.

- If you decide to rewrite the standards statement, study the following guidelines:

- The STANDARDS statement tells the standard (criterion) by which the performance is evaluated.

  — The criteria for standards—completeness, accuracy and time are summarized in the table below.

Criteria for Standards in Objectives

CRITERIA FOR GOOD STANDARDS	WHAT IS SPECIFIED
Completeness	The precise nature of the output. Number of features that output must contain. Number of steps, points, pieces, etc., that must be covered or produced. Any quantitative statement that indicates acceptable portion of total.
Accuracy	How close to correct the performance must be. Exact numbers reflecting tolerances. Values or dimensions that acceptable answers/performance can assume. (These may be qualitative.)
Time	How many days, hours, minutes, or seconds can be used.

  — Check the standards statement to see that it includes quantitative terms whenever possible. Remember, however, that some standards are not directly quantifiable, such as:

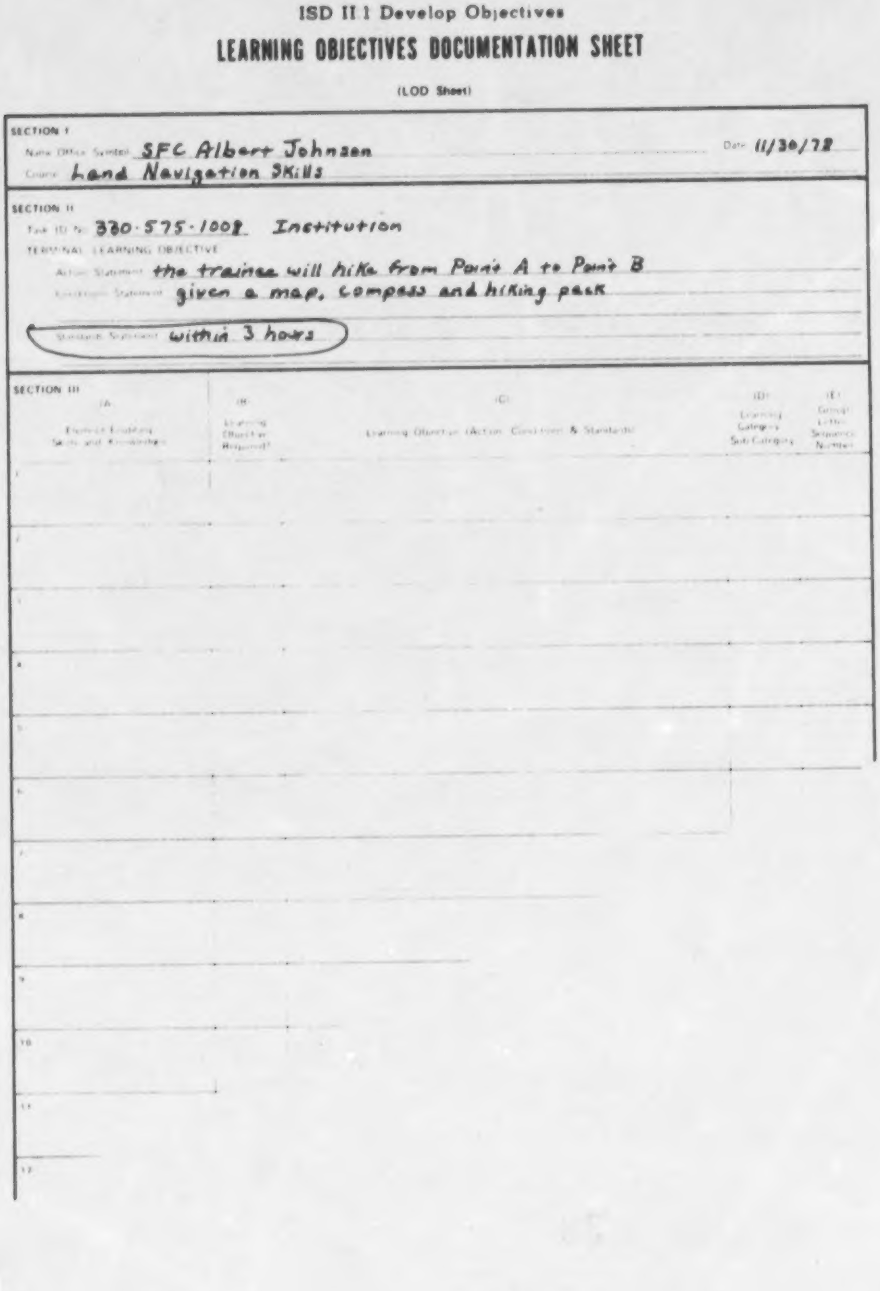
  a. adjusting a carburetor until the engine runs at its smoothest point

  b. making a patient feel comfortable (you could follow a procedure but not succeed if you were hostile).

- More guidelines for writing standards statements are included in block 44 of this job aid.

What does the LOD Sheet look like when the TLO standards statement has been recorded?

Example:



ISD II.1 Develop Objectives

LEARNING OBJECTIVES DOCUMENTATION SHEET

(LOD Sheet)

SECTION I

Name/Office Symbol: SFC Albert Johnson
Date: 11/30/78
Course: Land Navigation Skills

SECTION II

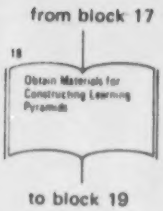
Task ID No: 330-575-1008 Institution

TERMINAL LEARNING OBJECTIVE

Action Statement: the trainee will hike from Point A to Point B
Condition Statement: given a map, compass and hiking pack
Standards Statement: within 3 hours

SECTION III

(A) Element Enabling Skills and Knowledges	(B) Learning Objective Required?	(C) Learning Objective (Action, Conditions & Standards)	(D) Learning Category Sub-Category	(E) Group/Letter Sequence Number
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				



- This block begins the learning analysis process. Learning Analysis is a graphic display of the task elements with their enabling skills and knowledges, in the format of a "learning pyramid."
- Materials include special 3" X 5" cards and large sheets of paper and tape.
- For guidance on obtaining materials for Learning Pyramids, see below.

What materials are needed for constructing the learning pyramids and where do I obtain them?

- You will need Learning Pyramid (LP) Cards, one white, and many yellow, and a large work space.

- The learning analysis you are about to construct for each task element may require a large amount of space. The task element itself and each enabling skill and knowledge (for at least two levels of analysis) are recorded on the 3" x 5" yellow Learning Pyramid Cards available for duplication in the pocket at the back of this manual. Obtain about 30 at a time. Obtain one white card for the task action statement.

- You should have a large surface available on which to arrange the cards from the task element at the top, down to the entry level prerequisite skills/knowledges required to perform the element, at the bottom. A desk or table top, or large bulletin board is ideal. However, since such space is not likely to be available you can also use butcher paper or newsprint, approximately 2 feet by 3 feet. The cards can be taped to the paper. In this way the paper, with the completed learning pyramid, can be moved about or even stored away.

from block 18
19
Record Appropriate Information on Learning Pyramid Cards
to block 20

- There are two kinds of Learning Pyramid (LP) cards:
  - White cards on which task number, instructional setting, learning objective number, and TLO action statement are recorded in this step.
  - Yellow cards on which only the task number is recorded in this step.
- For further information and guidance, see Manual, page E-__.

Where do I obtain and how do I record information on LP Cards?

- **White Cards**

  — Purpose

  Only one white card is used per task as it represents the terminal learning objective (TLO). When all the learning pyramids constructed for each element are combined, in a later step, the white card is placed at the top.

  — What to record in this step

  1) Task number (shown on LOD Sheet)
  2) Instructional Setting (shown on LOD Sheet)
  3) Learning Objective Number (last 4 digits of task number)
  4) TLO Action Statement (shown on LOD Sheet)

- **Yellow Cards**

  — Purpose

  The yellow cards are used to actually build the pyramids. There is no way of knowing how many you will need, but only 30 is suggested as a start.

  — What to record in this step

  For every yellow card you use, it is necessary to record:

  1) Task number (shown on LOD Sheet and white LP card)

What do the white and yellow LP cards look like?

White LP Card
(Example)

Task # 330-575-1008

Instructional Setting Institution

Learning Objective # 1008

Group Letter ____

Sequence # ____

Action Statement:

hike from point A to point B

Yellow LP Card
(Example)

Task # 330-575-1008

Element/Enabling S&K # ____

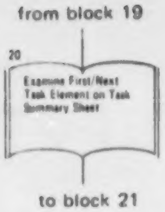
Learning Category/Subcategory ____ ____

Learning Objective # ____

Group Letter ____

Sequence # ____

Action Statement:



- Task element is examined to determine if it is unitary. If not, it is broken down into individual actions.
- For further information, see below.

What should I look for when examining an element on the Task Summary Sheet?

- Read the element to see if it describes a unitary action (one action) or compound actions (more than one). You will find that many of the performance measures on the Task Summary Sheets are written as compound elements. For example:

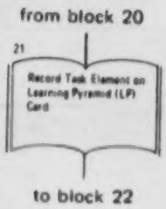
  Task Action Statement: "Install the M16A bounding antipersonnel mine with and without tripwires."

  The first performance measure to this task consists of compound elements: "Inspect and fuse the mine."

  This compound element must be rewritten and analyzed as two unitary elements. You will construct a learning pyramid for each one.

  Inspect the mine

  Fuse the mine


from block 20
21
Record Task Element on Learning Pyramid (LP) Card
to block 22

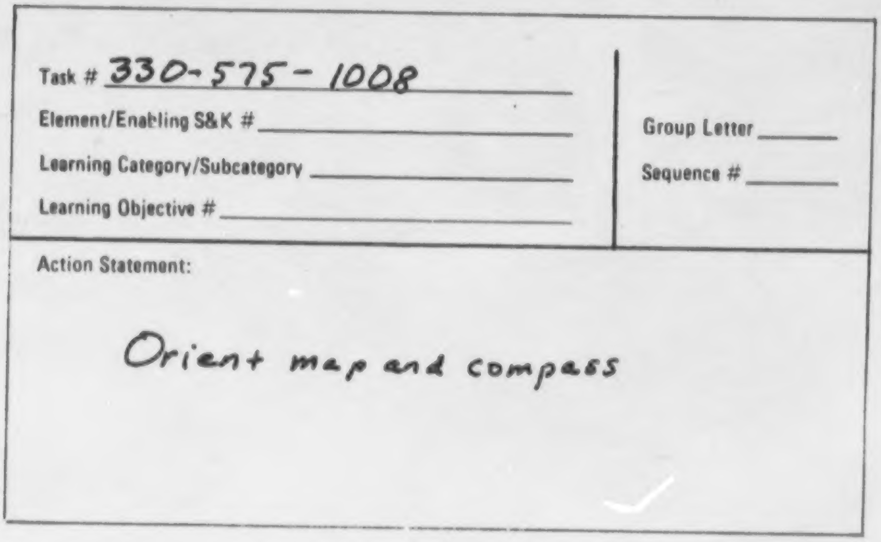
- For guidance on recording task element for Learning Pyramids, see below

---

How is an element recorded for the Learning Pyramid?

- Write the action statement of only the task element on the yellow Learning Pyramid (LP) Card and tape it on the top center of a large sheet, or arrange it on a large surface.

For Example:



Task # 330-575-1008

Element/Enabling S&K # ________

Learning Category/Subcategory ________

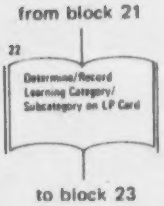
Learning Objective # ________

Group Letter ________

Sequence # ________

Action Statement:

Orient map and compass



- There are three learning categories and nine subcategories
  - I Mental
    - 1 Identify Objects and Symbols
    - 2 Recalling Information
    - 3 Discriminating
    - 4 Classifying
    - 5 Rule Learning and Using
    - 6 Decision Making
  - II Physical
    - 1 Gross Motor Skills
    - 2 Responsive Motor Skills
  - III Attitudinal
    - 1 Attitude Learning
- For further information and guidance, see below.

How do I identify the learning categories and subcategories for task elements?

- The chart on the next page shows the three learning categories: mental, physical and attitudinal. Although the Job Aid for ISD III.1, Specify Learning Events and Activities, gives a complete explanation of learning categories/subcategories, and how to identify them, at this point you should have a basic idea of what they are. This will help you to write objectives which more accurately describe the desired behavior. For instance, if the task calls for tuning an engine, you will need some learning objectives which describe the various mental skills involved, and of course some responsive motor skills. You may also want to teach the attitudinal skill of appreciating the importance of a well tuned engine. The reason for being aware of these different categories/subcategories is to prevent you from writing an objective like "state the steps in tuning an engine," as a TLO if you really want the person to actually tune the engine. "State the steps . . ." may be one of the LOs involving the mental category of recalling information, but it does not match the desired task performance.

LEARNING CATEGORY	LEARNING SUBCATEGORY	DEFINITION OF SUBCATEGORY	SAMPLE ACTION VERBS
MENTAL	identifying objects and symbols	giving one unvarying response whenever a particular object/ symbol is presented	Identify Interpret Read
	recalling information	repeating memorized information orally or in writing	List State Recite Define
	discriminating	when presented with items that appear to be similar, identifying the differences between them	Monitor Distinguish Detect Discriminate
	classifying	when presented with items that appear to be different, identifying the features which they have in common	Identify Recognize Classify
	rule-learning and using	stating when and how a principle applies to a given situation	Select Predict Determine Specify Apply
	decision-making	specifying a course of action for use in a problem situation	Choose Decide Formulate Select Evaluate
PHYSICAL	gross motor skill	moving all or parts of the body in order to perform a set action	Cut Weld Saw Drill Splice Draw
	responsive motor skill	moving all or parts of the body in response to continually changing cues to action	Track Control Steer Guide Regulate
ATTITUDINAL	attitude-learning	exhibiting a pattern of behavior or of response towards something	Accept Choose Comply with

---

- After looking at the chart you may feel it is difficult to choose a specific category. Often more than one type of learning is called for. Then you must select the one that most closely matches the desired behavior.

What does the LP Card look like when the learning category/subcategory has been recorded?

Example:

Task # 330-575-1008

Element/Enabling S&K # ________

Learning Category/Subcategory M/rule learning + using

Learning Objective # ________

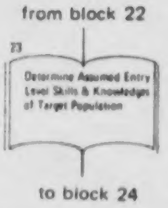
Group Letter ________

Sequence # ________

Action Statement:

Orient map and compass

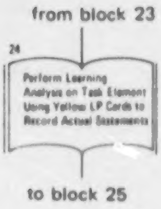
- Note in the example that M stands for mental. You may wish to use P for physical, and A for attitudinal.


from block 22
23
Determine Assumed Entry Level Skills & Knowledges of Target Population
to block 24

- The level of detail of the analysis is based on the assumed entry level (prerequisite) skills/knowledges of the soldiers who will be receiving the instruction based on these objectives.
- For further information and guidance, see below.

How do I make assumptions about the entry skills and knowledge of the target population?

- Entry behavior includes the skills, information and attitudes that a soldier possesses at the time he comes for instruction. Of course there will be some variation of entry behaviors but the task should be broken down to the point where most prospective trainees have the prerequisite skills, knowledges and attitudes.
- Make assumptions on information about the personal qualifications of soldiers in this MOS and skill level, as stated in the job description. Consider such things as:
  - reading level
  - aptitude requirements
  - prior experience and training
  - academic requirements
- These assumptions will assist you in judging how far down your learning analysis should go. For example, skill level one tasks may require training for fundamental actions that you would not include if you were doing a learning analysis for skill level 3.


from block 23
24
Perform Learning Analysis on Task Element Using Yellow LP Cards to Record Actual Statements
to block 25

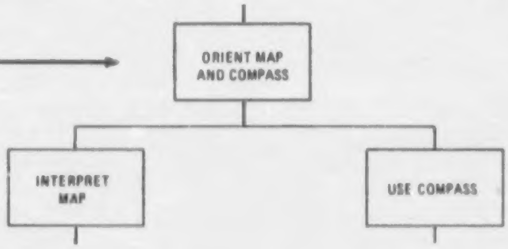
- The Learning Analysis, displayed by the Learning Pyramid, identifies the hierarchy (from simple to complex) of skills and knowledges required for performance of the task element.
- For further information and guidance, see Manual, page E

How do I perform learning analysis on a task element?

- Think about what someone would have to be able to do or know before he could accomplish this step. In other words, what are the enabling skills and knowledges? Write the action statements only on Learning Pyramid (LP) Cards.

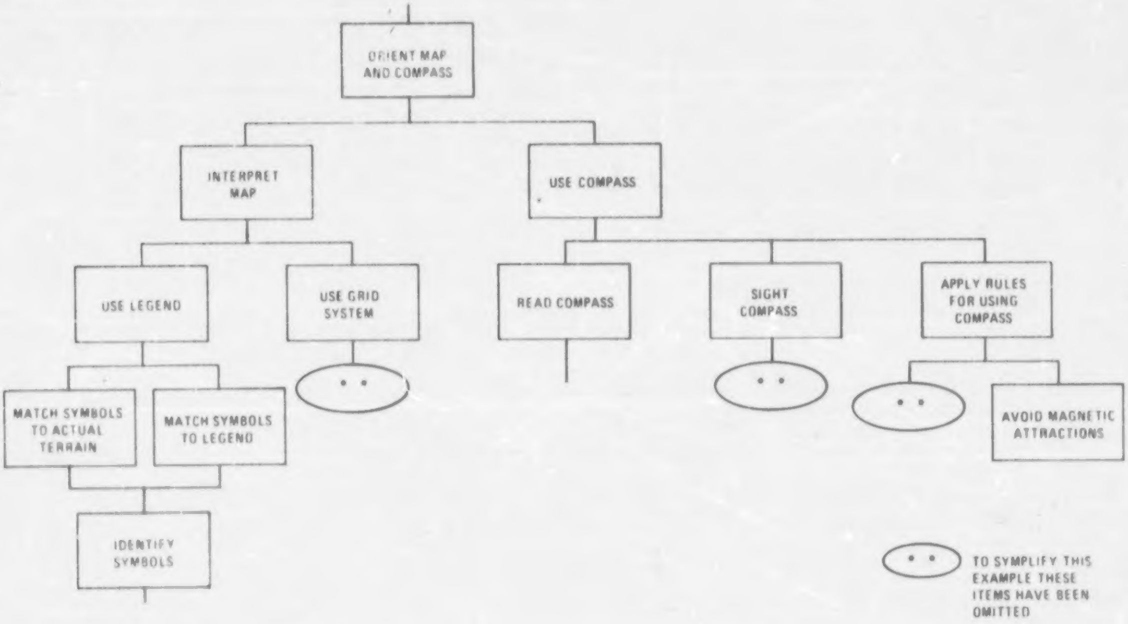
Example: Before he can do this →

He needs to know/do this →

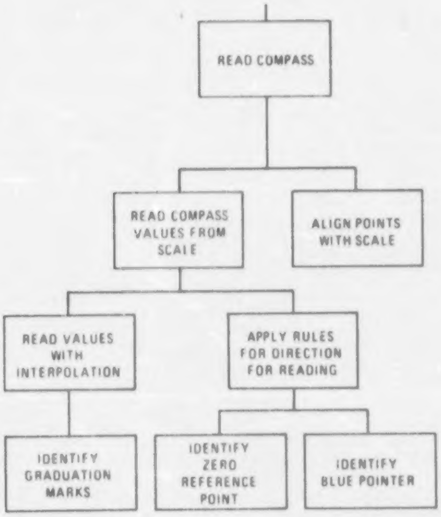

ORIENT MAP AND COMPASS
INTERPRET MAP
USE COMPASS

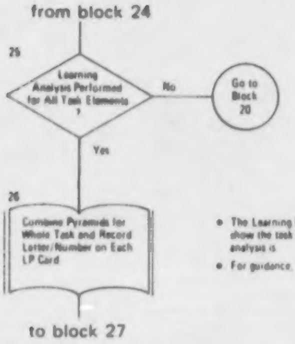
- Analyze the enabling skills/knowledges required to perform the element down through at least two subordinate levels, or even further if the entry level skills/knowledges of the target population has not been reached. Record action statements on the LP yellow cards (you do not need to record the learning category/subcategory for the sub-elements).

EXAMPLE:


ORIENT MAP AND COMPASS
INTERPRET MAP
USE COMPASS
USE LEGEND
USE GRID SYSTEM
READ COMPASS
SIGHT COMPASS
APPLY RULES FOR USING COMPASS
MATCH SYMBOLS TO ACTUAL TERRAIN
MATCH SYMBOLS TO LEGEND
AVOID MAGNETIC ATTRACTIONS
IDENTIFY SYMBOLS
TO SYMPLIFY THIS EXAMPLE THESE ITEMS HAVE BEEN OMITTED

To continue:


READ COMPASS
READ COMPASS VALUES FROM SCALE
ALIGN POINTS WITH SCALE
READ VALUES WITH INTERPOLATION
APPLY RULES FOR DIRECTION FOR READING
IDENTIFY GRADUATION MARKS
IDENTIFY ZERO REFERENCE POINT
IDENTIFY BLUE POINTER

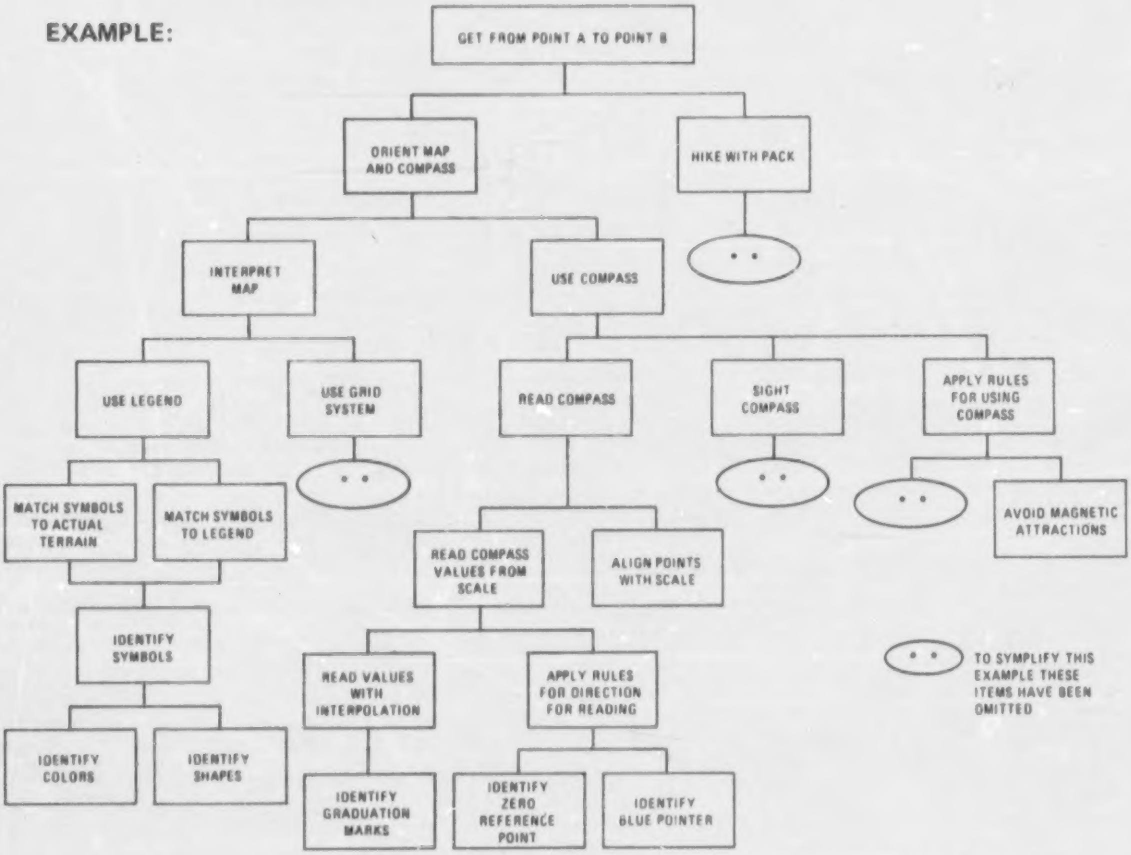

from block 24
25
Learning Analysis Performed for All Task Elements ?
No
Go to Block 20
Yes
26
Combine Pyramids for Whole Task and Record Letter/Number on Each LP Card
to block 27

- The Learning Pyramids for each task element are combined and numbered to show the task as a whole. This helps determine how complete the learning analysis is.
- For guidance, see below.

How do I combine the learning pyramids?

- You have been instructed to make separate pyramids for each task element. Now you want to show the task as a whole by lining up the pyramids side by side under the TLO action statement (on white card).

EXAMPLE:


GET FROM POINT A TO POINT B
ORIENT MAP AND COMPASS
HIKE WITH PACK
INTERPRET MAP
USE COMPASS
USE LEGEND
USE GRID SYSTEM
READ COMPASS
SIGHT COMPASS
APPLY RULES FOR USING COMPASS
MATCH SYMBOLS TO ACTUAL TERRAIN
MATCH SYMBOLS TO LEGEND
READ COMPASS VALUES FROM SCALE
ALIGN POINTS WITH SCALE
AVOID MAGNETIC ATTRACTIONS
IDENTIFY SYMBOLS
READ VALUES WITH INTERPOLATION
APPLY RULES FOR DIRECTION FOR READING
TO SYMPLIFY THIS EXAMPLE THESE ITEMS HAVE BEEN OMITTED
IDENTIFY COLORS
IDENTIFY SHAPES
IDENTIFY GRADUATION MARKS
IDENTIFY ZERO REFERENCE POINT
IDENTIFY BLUE POINTER

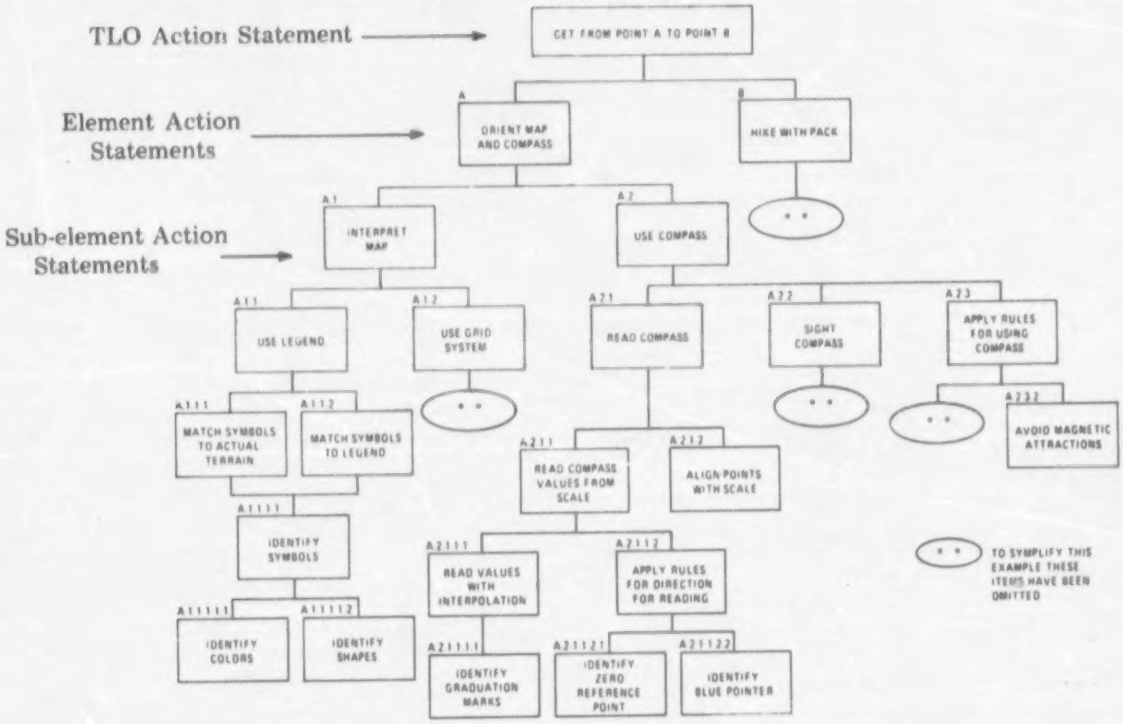
- Here you can see the complete task broken down into all of its elements and enabling skills and knowledges to the point of your target population's assumed entry level. This will help you check your learning analysis for completeness and accuracy.

- **Procedural Steps**

1. Line up pyramids side by side under the TLO action statement. This may be a little difficult depending on how many levels of enabling skills and knowledges there are. Just try to display the whole task as clearly as possible.

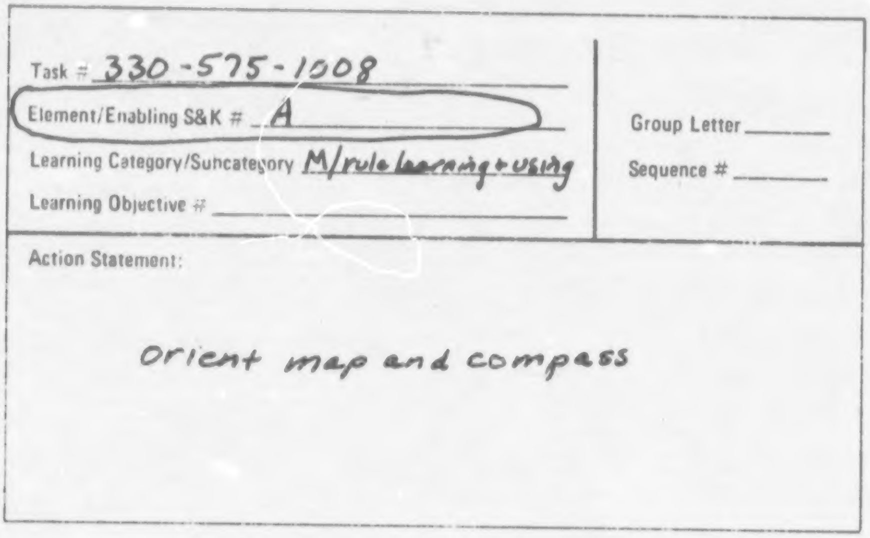
2. Now you can assign a number to each enabling skill and knowledge. The letter/number combination in the example on the following page is suggested. Each task element is assigned a letter A-B-C, etc. The sub-elements which make up the element are specified by prefacing them with the letter of the element followed by the appropriate decimal numbering.

EXAMPLE:


TLO Action Statement
Element Action Statements
Sub-element Action Statements
GET FROM POINT A TO POINT B
A
ORIENT MAP AND COMPASS
B
HIKE WITH PACK
A1
INTERPRET MAP
A2
USE COMPASS
A11
USE LEGEND
A12
USE GRID SYSTEM
A21
READ COMPASS
A22
SIGHT COMPASS
A23
APPLY RULES FOR USING COMPASS
A111
MATCH SYMBOLS TO ACTUAL TERRAIN
A112
MATCH SYMBOLS TO LEGEND
A232
AVOID MAGNETIC ATTRACTIONS
A211
READ COMPASS VALUES FROM SCALE
A212
ALIGN POINTS WITH SCALE
A1111
IDENTIFY SYMBOLS
A2111
READ VALUES WITH INTERPOLATION
A2112
APPLY RULES FOR DIRECTION FOR READING
A11111
IDENTIFY COLORS
A11112
IDENTIFY SHAPES
A21111
IDENTIFY GRADUATION MARKS
A21121
IDENTIFY ZERO REFERENCE POINT
A21122
IDENTIFY BLUE POINTER
TO SYMPLIFY THIS EXAMPLE THESE ITEMS HAVE BEEN OMITTED

What does the LP Card look like when the element/enabling skill and knowledge letter/number is recorded?

EXAMPLE:



Task # 330-575-1008

Element/Enabling S&K # A

Learning Category/Subcategory M/rule learning + using

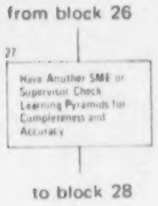
Learning Objective # ________

Group Letter ________

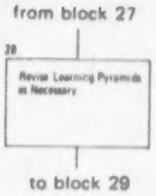
Sequence # ________

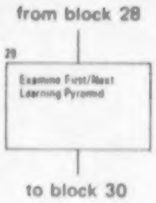
Action Statement:

Orient map and compass

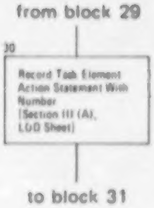

from block 26
27
Have Another SME or Supervisor Check Learning Pyramids for Completeness and Accuracy
to block 28

- Check by another subject matter expert will reveal any additions/deletions/changes required in analysis


from block 27
28
Revise Learning Pyramids as Necessary
to block 29


from block 28
29
Examine First/Next Learning Pyramid
to block 30

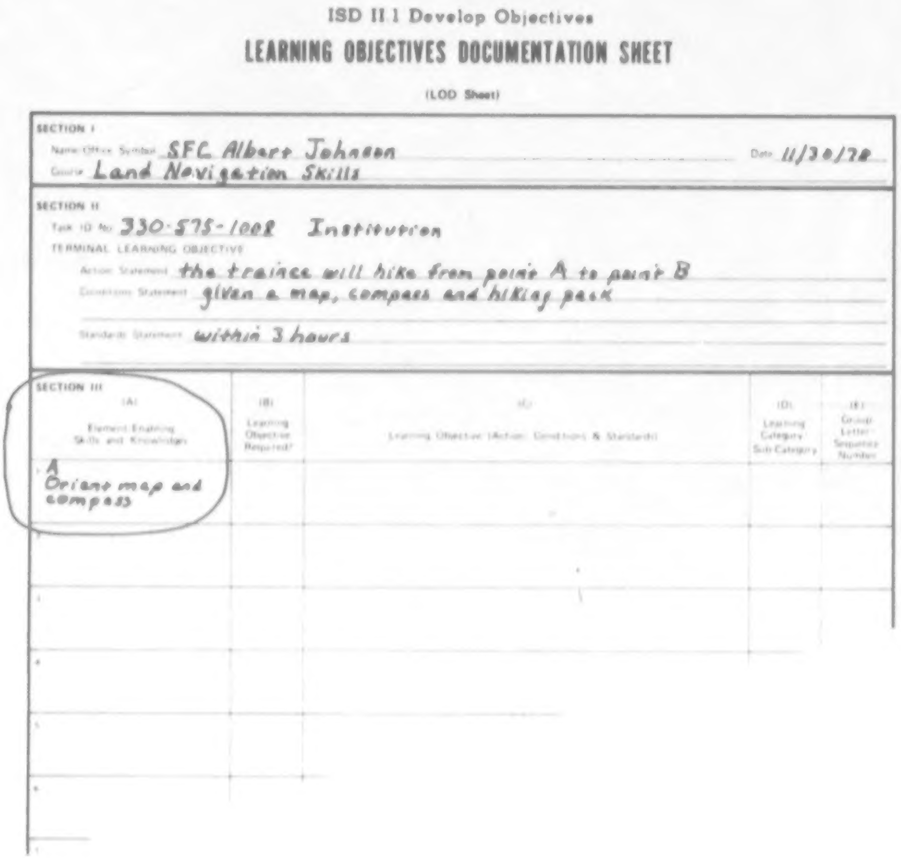
- This block begins the process of documenting the learning analysis on a permanent record.


from block 29
30
Record Task Element Action Statement With Number (Section III (A), LOD Sheet)
to block 31

- The action statement at the top of the pyramid is recorded
- For example, see below.

What does the LOD Sheet look like when an element action statement has been recorded?

EXAMPLE:



ISD II.1 Develop Objectives

LEARNING OBJECTIVES DOCUMENTATION SHEET

(LOD Sheet)

SECTION I

Name/Office Symbol SFC Albert Johnson Date 11/30/78

Course Land Navigation Skills

SECTION II

Task ID No 330-575-1008 Institution

TERMINAL LEARNING OBJECTIVE

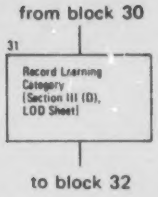
Action Statement the trainee will hike from point A to point B

Condition Statement given a map, compass and hiking pack

Standards Statement within 3 hours

SECTION III

(A) Element Enabling Skills and Knowledges	(B) Learning Objective Required?	(C) Learning Objective (Action, Conditions & Standards)	(D) Learning Category/ Sub Category	(E) Group Letter-Sequence Number
1 A Orient map and compass				



- The learning category for each task element is shown on the Learning Pyramid for each element.
- For example, see below.

What does the LOD Sheet look like when the learning category and subcategory for an element has been recorded?

EXAMPLE:

ISD II.1 Develop Objectives

LEARNING OBJECTIVES DOCUMENTATION SHEET

(LOD Sheet)

SECTION I

Name Office Symbol SFC Albert Johnson Date 11/30/78

Course Land Navigation Skills

SECTION II

Task ID No 330-575-1008

TERMINAL LEARNING OBJECTIVE

Action Statement the trainee will hike from point A to point B

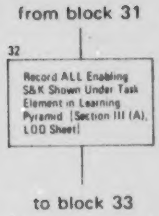
Conditions Statement given a map, compass and hiking pack

Standards Statement within 3 hours

SECTION III

(A) Element/Enabling Skills and Knowledges	(B) Learning Objective Required?	(C) Learning Objective (Action, Conditions & Standards)	(D) Learning Category/ Sub Category	(E) Group Letter/ Sequence Number
1 A Orient map and compass			M/rule learning +using	
2				

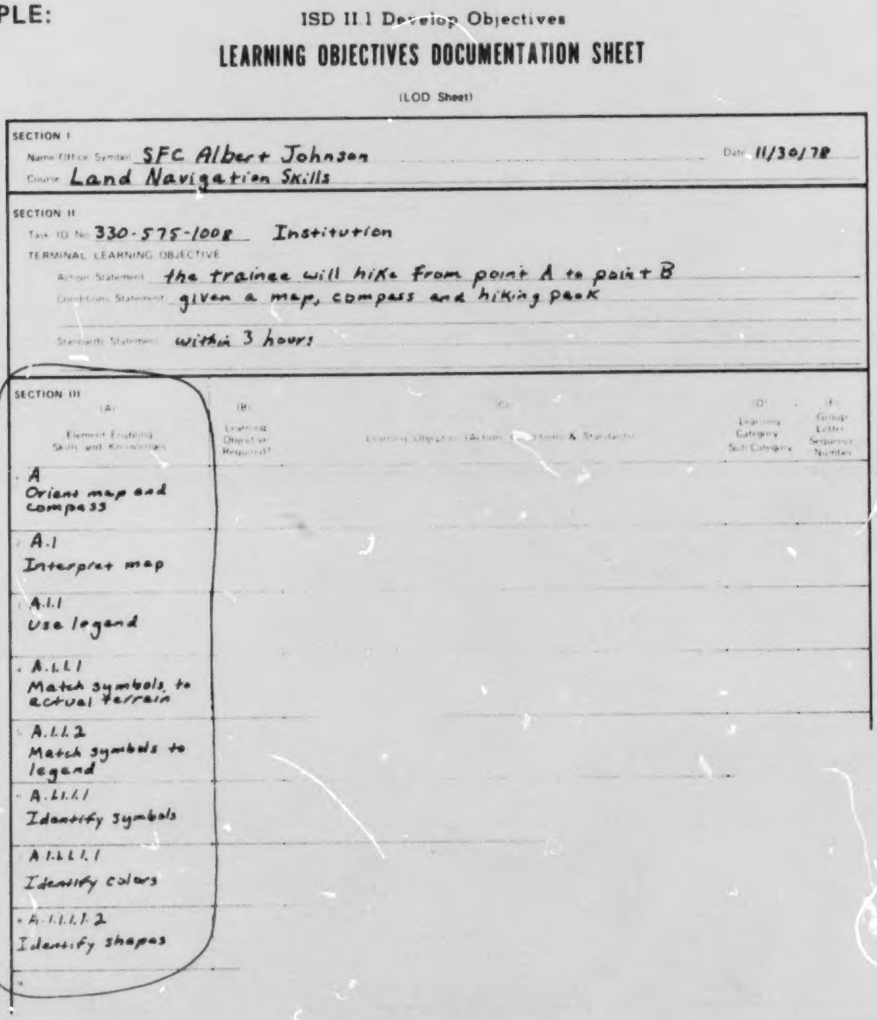
E-49


from block 31
32
Record ALL Enabling S&K Shown Under Task Element in Learning Pyramid [Section III (A), LOD Sheet]
to block 33

- Task elements are copied in order, that is
  A
  A 1
  A 1 1
  A 1 2
  B
  B 1
  etc
- For example, see below

What does the LOD Sheet look like when all enabling skills and knowledge for an element have been recorded?

EXAMPLE:



ISD II.1 Develop Objectives

LEARNING OBJECTIVES DOCUMENTATION SHEET

(LOD Sheet)

SECTION I

Name/Office Symbol SFC Albert Johnson
Date 11/30/78
Course Land Navigation Skills

SECTION II

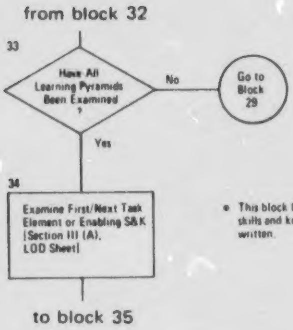
Task ID No 330-575-1008 Institution

TERMINAL LEARNING OBJECTIVE

Action Statement the trainee will hike from point A to point B
Conditions Statement given a map, compass and hiking pack
Standards Statement within 3 hours

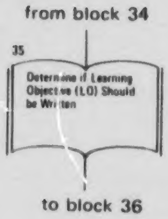
SECTION III

(A) Element Enabling Skills and Knowledges	(B) Learning Objective Required?	(C) Learning Objective (Action, Conditions & Standards)	(D) Learning Category Sub Category	(E) Group Letter Sequence Number
A Orient map and compass				
A.1 Interpret map				
A.1.1 Use legend				
A.1.1.1 Match symbols to actual terrain				
A.1.1.2 Match symbols to legend				
A.1.1.1.1 Identify symbols				
A.1.1.1.1.1 Identify colors				
A.1.1.1.1.2 Identify shapes				


from block 32
33
Have All Learning Pyramids Been Examined ?
No
Go to Block 29
Yes
34
Examine First/Next Task Element or Enabling S&K [Section III (A), LOD Sheet]
to block 35

- This question asks: Have all elements with their associated skills and knowledges been recorded in Section III A on the LOD Sheet?

- This block begins the process of determining which task elements and enabling skills and knowledges need to be trained, i.e., require a learning objective to be written.



- An objective does not need to be written for every task element or enabling knowledge and skill of a task.
- For further explanation, see below.

How do I determine if an objective should be written?

- In order to do a complete learning analysis it is necessary to show all elements and enabling skills/knowledges on the learning pyramid. However it is not necessary to write an objective for each of these.

- Write a learning objective for an element or its enabling skills and knowledges when:

1) It is a CRITICAL ELEMENT, or SKILL/KNOWLEDGE belonging to a critical element. Critical elements were identified in ISD Block I.3, Task Analysis, as those task elements which have one or more of the following characteristics:

   a) They are one of the most measurable and observable elements of the task.

   b) They have serious consequences of inadequate performance.

   c) They are common sources of failure.

   These critical elements were marked with an asterisk on the Task Summary Sheets.

2) It is an action which the soldiers of the target population do not already know how to do and must therefore be taught.

3) An objective has not already been written for this element or enabling skill/knowledge. You will often find several enabling skills/knowledges which are common to more than one element. For example: in the task "tune a V-8 engine" it is necessary to use a feeler gauge to:

   a) set point gap

   b) set spark plug gap

   c) adjust values

   In the learning analysis it is necessary to record the use of the feeler gauge for several elements. However, it is only necessary to write one learning objective. This becomes a COMMON ELEMENT OBJECTIVE.

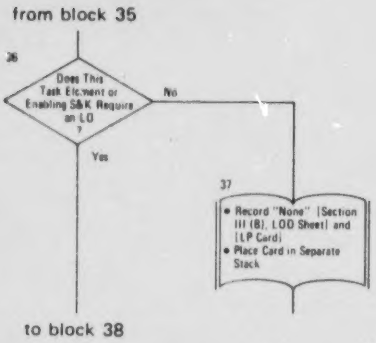
EXAMPLE:

LO #1 Set point gap
LO #1.1 — — — —
LO #1.1.1 — — — —
LO #1.1.2 Use feeler gauge

LO #2 Set spark plug gap
LO #2.1 — — — —
LO #2.1.1 — — — —
(Use feeler gauge)

LO #3 Adjust valves
LO #3.1 — — — —
LO #3.1.1 — — — —
(Use feeler gauge)

Only one objective is written for use of feeler gauge in this task. When objectives are grouped and sequenced in ISD Block II.4, Sequence and Structure Objectives, many objectives will be common to a group of tasks. At that time more objectives will be identified as common element and grouped together so that they are only taught once.


from block 35
36
Does This Task Element or Enabling S&K Require an LO ?
No
Yes
37
• Record "None" [Section III (B), LOD Sheet] and [LP Card]
• Place Card in Separate Stack
to block 38

- For examples of LOD Sheet and Learning Pyramid Cards when this information has been recorded, see below.

What does the LOD Sheet look like when no requirement for a learning objective is indicated? What does the LP Card look like?

EXAMPLES:

LOD Sheet

Match symbols to actual terrain		
A.1.1.2 Match symbols to legend		
A.1.1.1.1 Identify symbols		
A.1.1.1.1.1 Identify colors	none	
A.1.1.1.1.2 Identify shapes	none	

LP Card

Element/Enabling S&K A.1.1.1.1.2

Learning Category/Subcategory ______

Learning Objective # none

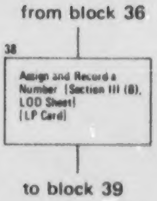
Group Letter ______

Sequence # ______

Action Statement:

What do I do with the LP Cards which do not require a learning objective to be written?

- Place these cards in a separate stack from those which do require an objective.


from block 36
38
Assign and Record a Number [Section III (B), LOD Sheet] [LP Card]
to block 39

- LO number is a combination of the last four digits of the task number and the letter/number combination assigned to each task element or enabling skill and knowledge in Section III (A)
- For examples of LOD Sheet and Learning Pyramid cards when an LO number has been assigned, see below.

What does the LP Card look like when learning objective numbers have been assigned? What does the LOD Sheet look like?

EXAMPLES:

Task # 330-575-1008

Element/Enabling S&K # A.1.1.1.1

Learning Category/Subcategory ________

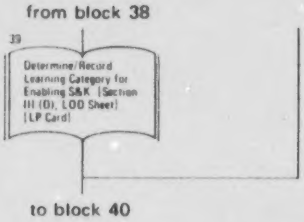
Learning Objective # 1008-A.1.1.1.1

Group Letter ________

Sequence # ________

Action Statement:

SECTION III (A) Element/Enabling Skills and Knowledges	(B) Learning Objective Required?	(C) Learning Objective (Action, Conditions & Standards)	(D) Learning Category/ Sub Category	(E) Group Letter Sequence Number
1 A Orient map and compass	1008 A			
2 A.1 Interpret map	1008 A.1			
3 A.1.1 Use legend	1008 A.1.1			
4 A.1.1.1 Match symbols to actual terrain	1008 A.1.1.1			
5 A.1.1.2 Match symbols to legend	1008 A.1.1.2			
6 A.1.1.1.1 Identify symbols	1008 A.1.1.1.1			


from block 38
39
Determine/Record Learning Category for Enabling S&K (Section III (D), LOO Sheet) (LP Card)
to block 40

- The learning category of each task element taken from the Task Summary Sheet was determined in Block 22. It is now necessary to identify the learning category of each enabling skill and knowledge which requires an objective to be written so that the proper action word can be selected.
- For review of learning category information, see below.

How do I determine and record the learning category for each enabling skill and knowledge?

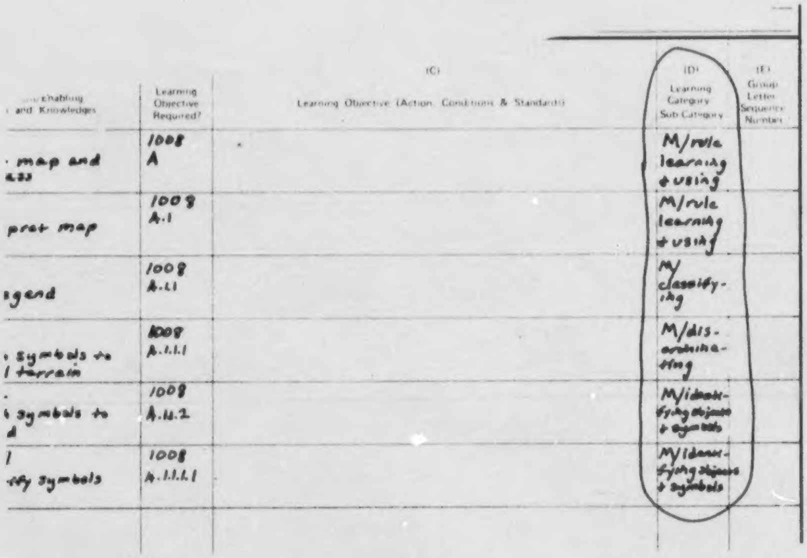
- The chart on the following page shows the three main learning categories and their subcategories.
- Look at the action word used in the action statement. Try to determine what type of learning is required for this element. Often, more than one type of learning is called for. Then you must select the one which is most obvious.
- More information on identifying learning categories is given in Manual ISD III.1, Specify Learning Events/Activities, or you may refer to page E-35 in this manual.

LEARNING CATEGORY	LEARNING SUBCATEGORY	DEFINITION OF SUBCATEGORY	SAMPLE ACTION VERBS
MENTAL	identifying objects and symbols	giving one unvarying response whenever a particular object/ symbol is presented	Identify Interpret Read
	recalling information	repeating memorized information orally or in writing	List State Recite Define
	discriminating	when presented with items that appear to be similar, identifying the differences between them	Monitor Distinguish Detect Discriminate
	classifying	when presented with items that appear to be different, identifying the features which they have in common	Identify Recognize Classify
	rule-learning and using	stating when and how a principle applies to a given situation	Select Predict Determine Specify Apply
	decision-making	specifying a course of action for use in a problem situation	Choose Decide Formulate Select Evaluate
PHYSICAL	gross motor skill	moving all or parts of the body in order to perform a set action	Cut Weld Saw Drill Splice Draw
	responsive motor skill	moving all or parts of the body in response to continually changing cues to action	Track Control Steer Guide Regulate
ATTITUDINAL	attitude-learning	exhibiting a pattern of behavior or of response towards something	Accept Choose Comply with

What do the LOD Sheet and LP Cards look like when the learning category and subcategory are recorded?

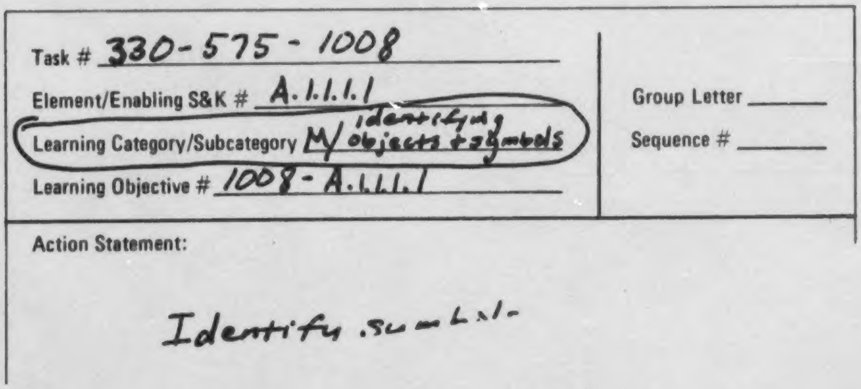
EXAMPLES

LOD Sheet



Enabling and Knowledges	Learning Objective Required?	(C) Learning Objective (Action, Conditions & Standards)	(D) Learning Category Sub Category	(E) Group Letter Sequence Number
map and	1008 A		M/rule learning + using	
pret map	1008 A.1		M/rule learning + using	
egend	1008 A.1.1		M/classifying	
symbols to l terrain	1008 A.1.1.1		M/discriminating	
symbols to d	1008 A.1.1.2		M/identifying objects + symbols	
l ify symbols	1008 A.1.1.1.1		M/identifying objects + symbols	

LP Card



Task # 330-575-1008

Element/Enabling S&K # A.1.1.1.1

Learning Category/Subcategory M/identifying objects + symbols

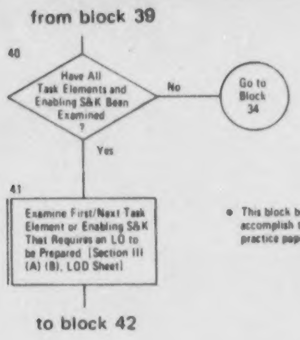
Learning Objective # 1008-A.1.1.1.1

Group Letter ______

Sequence # ______

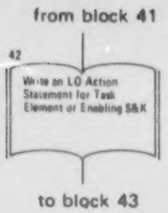
Action Statement:

Identify symbols


from block 39
40
Have All Task Elements and Enabling S&K Been Examined ?
No
Go to Block 34
Yes
41
Examine First/Next Task Element or Enabling S&K That Requires an LO to be Prepared (Section III (A) (B), LOD Sheet)
to block 42

- This question asks: Have all task elements and enabling skills and knowledges been examined to determine if they require a learning objective?

- This block begins the process of writing adequate learning objectives needed to accomplish the terminal learning objective. First draft LOs can be written on practice paper, then transferred to the LOD Sheet in a later step.


from block 41
42
Write an LO Action Statement for Task Element or Enabling S&K
to block 43

- For guidance on how to write an adequate LO action statement, see below.

How do I write an LO action statement?

- General guidelines for writing action statements for the terminal learning objective were given on pages E-20, E-21 and E-22. They are reviewed and expanded here. You will notice that the same rules apply to writing both TLOs and LOs.

1) Use ACTION verbs

   Write a statement that tells what the trainee does, using ACTION verbs that are:

   OBSERVABLE - You can see the performance
   MEASURABLE - You can check the performance for correctness
   RELIABLE - Everyone would interpret the action called for in the same way.

2) Describe UNITARY actions

   Write a statement that describes a UNITARY action. "Load and unload weapon" may be the task statement given in the Soldier's Manual, but when writing learning objectives it should be made into two unitary LOs: (a) "Load weapon" and (b) "Unload weapon." (Having unitary objectives simplifies the job of the test item writer since one test item should not cover two actions).

3) CLARIFY main intent if necessary

Write a statement in which the main intent is CLEAR and operationally defined.

Here are some examples of performance statements in which the main intent is a clearly specified, directly observable performance.

- "Cross a wire obstacle . . ." The performance called for is crossing a wire obstacle and that is the main intent. Crossing the wire can be directly observed.
- "Unlock the security container . . ." Unlocking is directly observable, and the objective's main intent is that a person be able to unlock the container.
- Here is an example of a performance statement in which the main intent is clear but the performance called for is an INDICATOR.
- "Circle the picture of the proper shears to use for cutting a curved line in sheet metal . . ."

Circling the picture is the performance called for, but certainly not the main intent of the objective. The main intent is clear, though—knowing which type of shears to use for the task. If the objective wanted the individual to know which type of shears to use and how to use them, it might have been stated as follows:

- "Given five different types of shears, select the proper shears and cut a curved line in the piece of sheet metal." In this case the main intent of the performance is cutting a curved line with the appropriate shears; there is no indicator.

The following are examples of action statements in which the main intent is unclear and no indicator is provided:

— "Be aware of techniques for setting up a drop zone . . ."

"Being aware" of something is vague and ambiguous. How could a trainee show that he is "aware"? What action is called for? Does the objective want the person to be able to set up a drop zone, or supervise setting up, or teach how to set up a drop zone? You can't tell from the performance statement because the main intent is unclear. Also note that there is no indicator provided which would tell you how to measure "being aware."

— "Demonstrate an understanding of the differences between treating a simple fracture and a compound fracture . . ."

As in the preceding example, the main intent is unclear; you don't really know the purpose of the objective. Are you supposed to find out if an individual can treat both types of fracture, or are you supposed to see if a person tries to treat a compound fracture like a simple one? You can't tell. Also there is no indicator to help you figure out how you are supposed to measure the "demonstration of an understanding." So you really don't have any idea of what performance is called for, though at first glance the statement may have appeared to actually state a performance.

Finally, let's look at some examples of performance statements with clear indicators but with unclear main intents.

Consider this example:

— "Place a check mark beside the part numbers of the parts needed to replace the brush assemblies on the 45 KW generator . . ."

Note that the indicator is perfectly clear but that the main intent is not readily apparent. The main intent could include any of the following:

- Be able to select the correct parts for replacing generator brushes.
- Be able to correctly read and interpret a list of part numbers.
- Be able to fill out a request for replacement parts.
- Be able to sort parts needed for one repair task from parts needed for another repair task.

So you really don't know what the indicator is supposed to indicate.

Now look at this example:

— "Demonstrate an understanding of good briefing skills by listing the three main parts of a briefing . . ."

Here the indicator is clear; it calls for an observable act—listing. And it might sound like the main intent is clear. But is it really? Does "listing the three main parts of a briefing" demonstrate an understanding of good briefing skills? Listing the main parts of a briefing only indicates an individual's knowledge of such parts, not his ability to conduct a successful briefing nor even to recognize whether a particular briefing is organized in three parts. Although the main intent is stated, it is not clear. In any case, the indicator doesn't even seem to be in the same ballpark. The point is that you don't really know what the main intent is, and the indicator is the performance that the person who wrote the objective wants measured and the main intent was just poorly stated. Or perhaps the indicator is poor and the main intent should be clarified and supported by a different indicator.

— When the main intent of your objective is unclear, you must revise it.

---

4) Use SIMPLE, DIRECT, known performance indicators

If you must use a performance indicator, check to see that it is SIMPLE, DIRECT, and SOMETHING THE TRAINEE ALREADY KNOWS HOW TO DO.

If the main intent of the objective is clear, you must next ask whether it is overt or covert. An overt main intent is one which is observable and measurable. In the preceding section, the examples of "cross a wire obstacle" and "unlock the security container" were overt main intents. Overt main intents do not require indicators: They already tell you what performance is called for and how to measure it.

Covert main intents require indicators since the performances they require are not directly observable. A covert main intent tells you the unobservable performance which the objective is about, while its indicator tells you how to measure whether or not an individual can perform it.

If your objective's main intent is measured through an indicator, you should make sure that the indicator is appropriate. A good indicator is:

- Simple. That is, it is as uncomplicated as possible. You don't want the main intent obscured by an unnecessarily complicated indicator.
- Direct. Indicators are used when the performance called for by the main intent of the performance statement is either not directly observable or not practical in the testing situation. But the indicator should be as straightforward as possible. It should allow you to determine whether or not the main intent has been satisfied without your having to go through chains of inference.
- Part of the trainees' normal repertoire of behavior. The trainee should be able to perform the indicator behavior: The indicator behavior itself is not what you want to train or test. You only use it as a measure of the main intent. So it is important that the indicator is simpler than the main intent and that the trainee can do it. If the indicator were not a part of the trainee's normal repertoire, you would be measuring two things—performance on the indicator and performance on the main intent.

Let's analyze some examples of indicators to see if they are as simple and direct as possible, and part of the normal repertoire. Here's the first example:

– "Show that you can recognize the major bones of the human skeletal system by drawing a picture of each bone beside the names of the bones provided on a mimeographed handout."

Okay, recognizing bones is the main intent, while drawing pictures of bones is how you indicate recognition. Drawing pictures of bones is a direct indicator in this case, since if a person can draw the correct picture next to the name of a bone, you know he can recognize the bone—you don't have to make any inferences. But drawing a picture is not the most simple indicator. Worse yet, drawing a bone well enough so that an examiner could identify it is not a part of the trainees' normal repertoire unless the trainees happen to be skilled illustrators. Thus, a person could fail to satisfy the objective because he can't draw well, not because he can't recognize the bone.

In fact, the indicator is a poor one for another reason: The main intent is to recognize bones but the indicator requires the person to recall what it looks like, then draw it.

A better indicator for this main intent would be ". . . by writing the name of the bone next to the picture of the bone" or, better yet, ". . . by choosing the correct name from the list provided and writing it next to the picture of the bone." (The pictures of the bones are provided on a mimeographed handout.)

Now consider this example:

- "Be able to recognize properly filled-out and improperly completed orders. Show your ability to do this by writing examples of each."

The indicator is "by writing examples of each." This indicator appears to be neither simple nor direct. The performance called for is a complex one—writing orders—and you would have to infer that an individual could recognize properly and improperly filled out orders based on his ability to write examples of each. In addition, the indicator behavior required appears to be more difficult than the behavior that the main intent is concerned with—the ability to discriminate between properly filled out orders and those which have not been properly completed. Thus, the indicator is less likely to be a part of the individual's repertoire than the main intent; this is exactly the opposite of the way things should be.

A better indicator would be ". . . sort examples of orders into two piles—those that are properly filled out and those that aren't." In this case, all the individual has to do is sort documents—a simple and direct indicator of ability to recognize proper and improper orders. This indicator would also be well within the normal behavioral repertoires of most trainees.

In summary, if the main intent of an objective is covert—not directly measurable for whatever reason—you should check to be sure that an appropriate indicator is included. Such an indicator will be as simple and direct a measure of the main intent as possible, and will require a behavior which the trainee is able to perform easily.

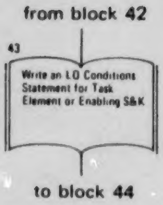
---

5. Select VERBS that reflect the learning category

Now that the learning category has been determined you can select an action verb that is appropriate to the level of learning.

— For example, if the task is to prepare subordinate's efficiency reports, then the mental subcategory of decision-making is the action to be learned. You could write the action statement using two verbs, one for the main intent, which identifies the learning sub-category and one for the indicator of the performance. Thus, you might write a statement like: Evaluate subordinates' performance and write results in the efficiency report. Here the action to be learned is evaluate, the indicator is write.

When the action word is related to the learning category it gives everyone, the trainee, the instructors, the course developer, and the test item writer, an exact description of the level and type of learning required.


from block 42
43
Write an LO Conditions Statement for Task Element or Enabling S&K
to block 44

- For guidance on how to write an adequate conditions statement, see below.

How do I write an LO condition statement?

- General guidelines for writing conditions statements for the TLO were given on pages E-24 and E-25. They are reviewed and expanded here, as the same rules apply to TLOs and LOs alike.

    1) Include in the conditions statement all environmental conditions, inputs and limitations do not affect performance.

        a) environmental conditions may include:

            location, indoors or out
            weather, cold, jungle, under water etc.
            time, daylight or blackout

        b) inputs may include whatever the trainee has to work with:

            job aids, checklists
            equipment
            technical references
            special tools

        c) limitations may include:

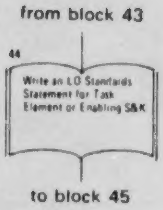
            special instructions
            problem situations or contingencies

    2) State the conditions in precise, operational terms. After writing the conditions statement ask yourself, "Does it really tell me all I need to know to establish proper conditions, or would someone else have to fill in the details? For instance: (see next page)

If The Condition Or Standard Is Intended To State:	Then This is An Improperly Specified Statement:
• Given a 45 KW generator with a broken shaft bearing . . .	• Given a malfunctioning generator . . .
• . . . under ordinary field conditions in daylight	• . . . under ordinary conditions
• . . . using a multimeter and signal generator only	• . . . using appropriate test equipment
• . . . without getting glue on the movable surfaces	• . . . taking proper precautions

Note that appropriate conditions are often related to the level of the objective. For example, a Level One Objective, (which is the same as the on-the-job task performance) may be to repair any malfunctioning generator. In this case "given a malfunctioning generator" is an appropriate statement of conditions. However, if the objective is a Level Two (TLO) or Level Three (LO), it may be more specific, such as "given a 45KW generator with a broken shaft bearing. In this case, any malfunctioning generator may not conform to the requirement of being precise and specified in operational terms.

3) Note that when the conditions are clearly implied they need not be stated. For example, when most tasks are performed in daylight conditions it is not necessary to state "in daylight." Record only those conditions which clearly affect how the task is performed.


from block 43
44
Write an LO Standards Statement for Task Element or Enabling S&K
to block 45

- For guidance on how to write an adequate standards statement, see below

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How do I write an LO standards statement?

- General guidelines for writing standards statements for the TLO were given on pages E-27 and E-28. They are reviewed and expanded here, as the same rules apply to TLOs and LOs alike.

  1) Include in the standards statement whatever measures of adequate performance apply to the task. There are three general types of measures: quantitative, qualitative, and time. On the following page are listed more specific types and examples of standards.

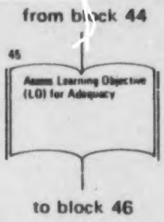
118

	DESCRIBE STANDARDS BY	EXAMPLE
A	Referring to a Standard Operating Procedure	"Given the situational requirements for an instrument approach, and the local airfield regulations, perform the procedure the pilot follows to complete an instrument landing. The performed steps will be in correct order and will comply with local regulations."
B	Implying the standard of NO ERROR	"Given the diameter of a sphere and the appropriate formula, use a calculator to compute to two decimal places the surface area of the sphere." Adding "He will perform without error" would not increase the requirement for accuracy.
C	Specifying minimum acceptable level of performance	"Using a slide rule, multiply two three-digit numbers and write the answer to the nearest tenth." This clearly states the degree of accuracy required for satisfactory achievement of the objective.
D	Specifying the time requirements	"Given a 200-word rough draft, type a letter without error at a minimum speed of 40 words per minute." Time is an important factor, so it is included in the objective.
E	Specifying the rate of production	"Given a rough draft of a final report, type pages without error at a minimum of 20 pages per day." The amount produced daily is an important factor, so it is included in the objective.
F	Specifying qualitative requirements	"Given a misadjusted carburetor and necessary tools, adjust the carburetor to idle at its smoothest point." Smoothness is a qualitative standard.

2) State the standards in precise, operational terms. After writing the standards statement ask yourself, "Does it really tell me all I need to know to establish proper standards, or would someone else have to fill in the details." Note

that appropriate standards are often related to the level of the objective. For example, a Level One objective (which is the same as on-the-job task performance) may be to type a letter without error at a minimum speed of 40 words per minute. In this case, the standard is appropriate. However, if the objective is a Level Two (TLO) or Level Three (LO), the standard may be more lenient. Many tasks require long practice before the task standard can be met. In the example just given a more appropriate standard might be "with 3 or less errors at a minimum speed of 30 words per minute."

3) Note that when the standards are clearly implied they need not be stated. For example, "Given a chart showing Army rank insignia, identify those which correspond to grades E-1 through E-9." Here it is not necessary to state the standard correctly. This is clearly implied.



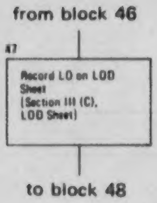
- A check list for assessing the adequacy of LOs is provided in the Manual. See below.

What do I look for when assessing the LO for adequacy?

- The following checklist will identify for you at a glance, all the features of a well-written learning objective (TLO or LO) suggested in this job aid.

1. Does the objective contain the three main parts of action, conditions and standards? (The second and third parts may be implied or may be previously stated on the LOD Sheet)
2. Is the objective unitary? (Does it specify a single action? See page E-60 for review).
3. Is the main intent of the objective clear? (Does it state precisely what the trainee is to do? See pages E-61 thru E-63 for review.)
4. If the main intent action word requires an indicator action word, is the indicator clear, direct, and something the trainee already knows how to do? (See pages E-64 thru E-66 for review.)
5. Is the action word appropriate for the type and level of learning called for by the task? (See page E-67 for review.)
6. Are actions, conditions and standards each stated in precise, operational terms?

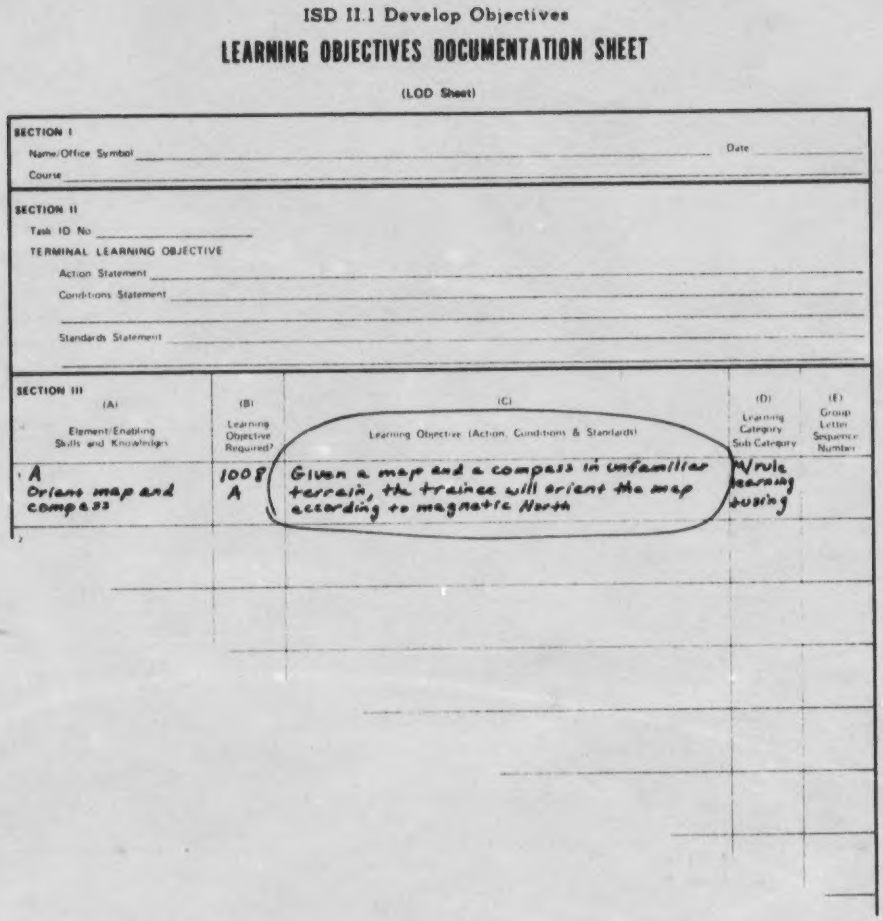
from block 45
46
Revise LO as Necessary
to block 47



- For example, see below.

What does the LOD Sheet look like when an LO is recorded?

EXAMPLE:



ISD II.1 Develop Objectives

LEARNING OBJECTIVES DOCUMENTATION SHEET

(LOD Sheet)

SECTION I

Name/Office Symbol ____________ Date ________

Course ____________

SECTION II

Task ID No ________

TERMINAL LEARNING OBJECTIVE

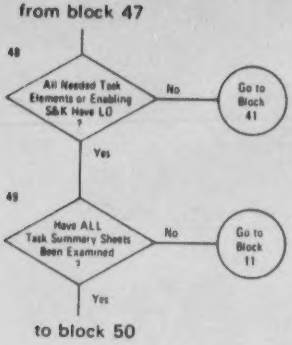
Action Statement ____________

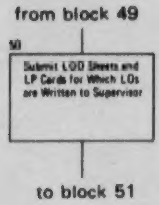
Conditions Statement ____________

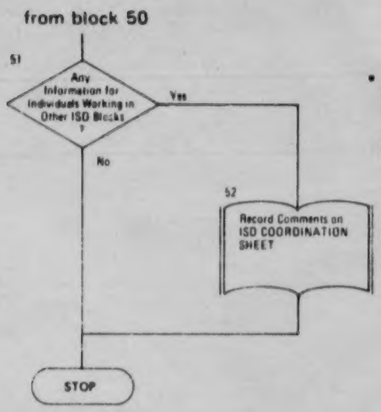
Standards Statement ____________

SECTION III

(A) Element/Enabling Skills and Knowledges	(B) Learning Objective Required?	(C) Learning Objective (Action, Conditions & Standards)	(D) Learning Category Sub Category	(E) Group Letter Sequence Number
1 A Orient map and compass	1008 A	Given a map and a compass in unfamiliar terrain, the trainee will orient the map according to magnetic North	Rule learning using	
2				


from block 47
48
All Needed Task Elements or Enabling S&K Have LO ?
No
Go to Block 41
Yes
49
Have ALL Task Summary Sheets Been Examined ?
No
Go to Block 11
Yes
to block 50


from block 49
50
Submit LOD Sheets and LP Cards for Which LOs are Written to Supervisor
to block 51


from block 50
51
Any Information for Individuals Working in Other ISD Blocks ?
Yes
No
52
Record Comments on ISD COORDINATION SHEET
STOP

- During the process of developing objectives information may have been obtained that would be useful to persons who performed activities that fed into this block. Similarly, information may have been obtained that would be useful to persons who will be engaged in Instructional Systems Development steps that follow this one

- Comments are recorded and submitted to appropriate persons
- For further guidance, see below

What is the importance of preparing comments for people working in other steps of the instructional systems development process? How do I record them?

- In order for the Instructional Systems Development process to work effectively it is imperative that there be forward and backward communication between the people involved in the process. At some time or other you have probably complained about the input that has been provided to you. Sometimes, you may have had to do work that should have been performed in previous steps.

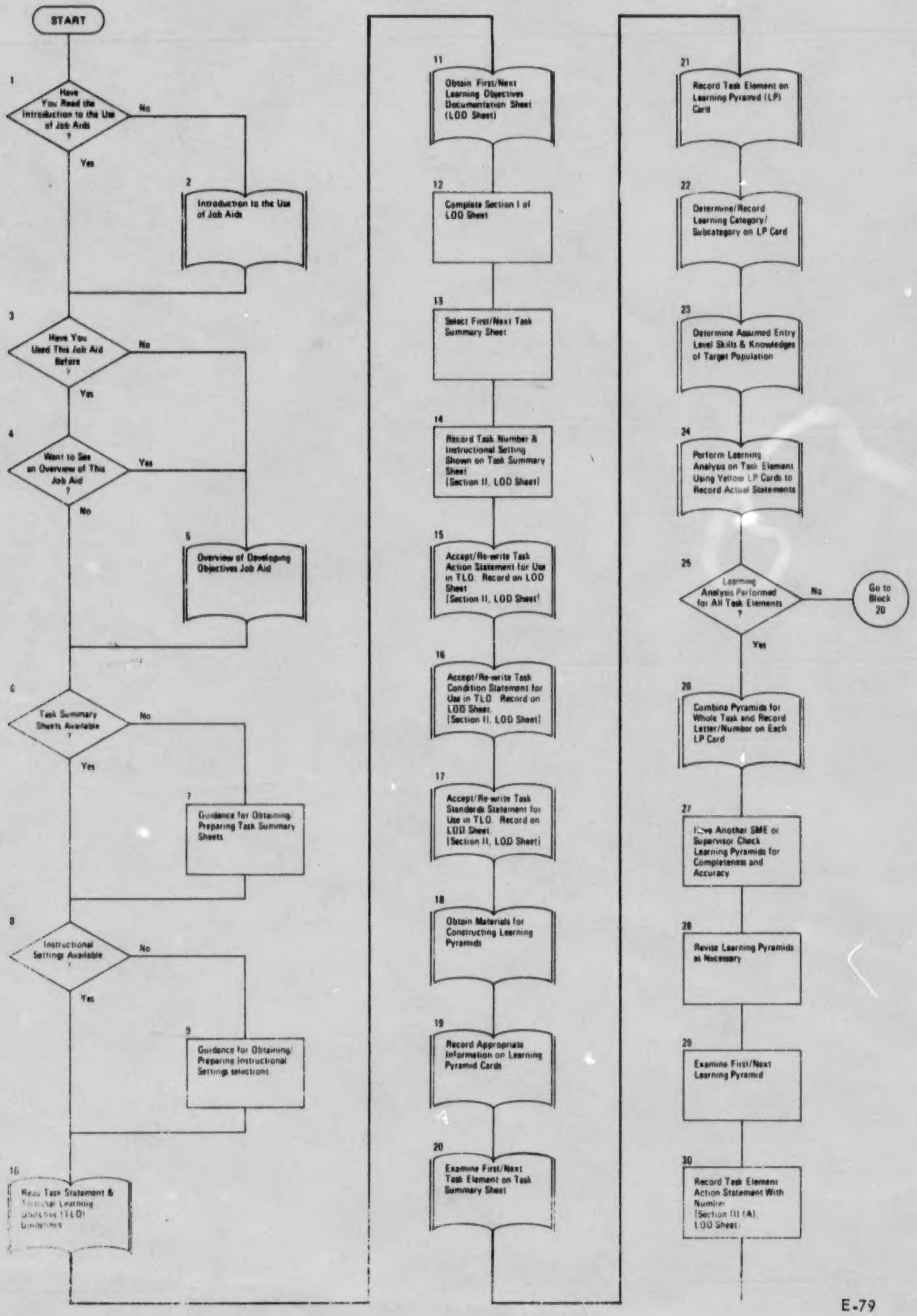
> IT IS IMPORTANT THAT YOU FEED THIS INFORMATION BACK TO THE APPROPRIATE PEOPLE SO THAT REVISIONS CAN BE MADE TO EFFECT IMPROVEMENT IN THE END PRODUCT.

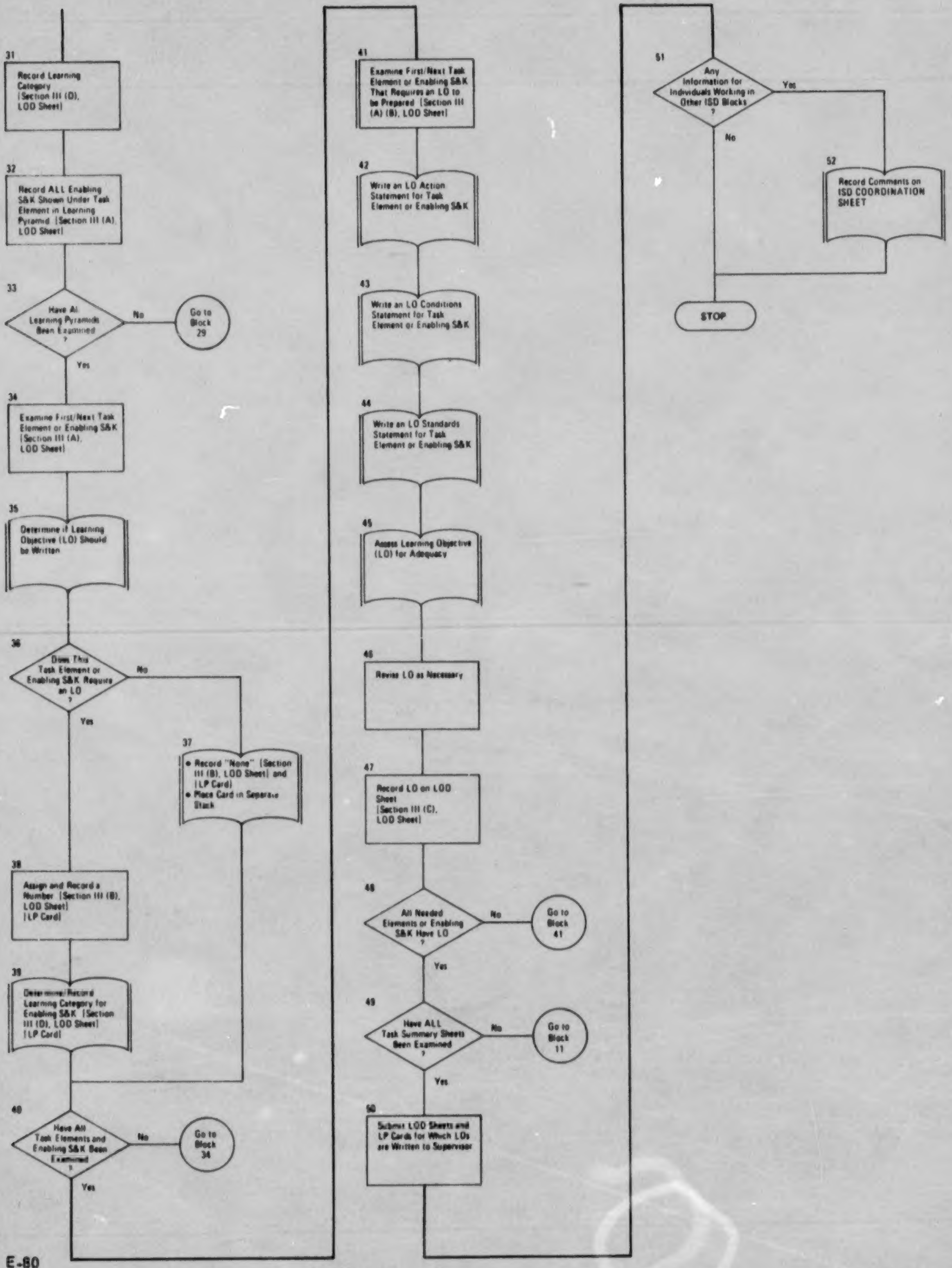
In your research for this step of the Instructional Systems Development process you may have discovered additional information that you think may be useful to people who will be working in steps that follow this one. If so, it is equally important that you pass this information on to appropriate people.

> REMEMBER, COMMUNICATION WITHIN THE INSTRUCTION SYSTEMS DEVELOPMENT PROCESS IS CRITICAL FOR EFFECTIVE INSTRUCTIONAL DEVELOPMENT

- A copy of the ISD COORDINATION SHEET can be found in the back of this manual. Make sufficient copies to enable you to send one to every individual you wish to communicate with—plus copies for your records.

- Complete the ISD COORDINATION SHEET in duplicate. Send one copy to the individual and attach one copy to the package of LOD Sheets.


START
1
Have You Read the Introduction to the Use of Job Aids ?
No
Yes
2
Introduction to the Use of Job Aids
3
Have You Used This Job Aid Before ?
No
Yes
4
Want to See an Overview of This Job Aid ?
Yes
No
5
Overview of Developing Objectives Job Aid
6
Task Summary Sheets Available ?
No
Yes
7
Guidance for Obtaining/ Preparing Task Summary Sheets
8
Instructional Settings Available ?
No
Yes
9
Guidance for Obtaining/ Preparing Instructional Settings selections
10
Read Task Statement & Terminal Learning Objective (TLO) Guidelines
11
Obtain First/Next Learning Objectives Documentation Sheet (LOD Sheet)
12
Complete Section I of LOD Sheet
13
Select First/Next Task Summary Sheet
14
Record Task Number & Instructional Setting Shown on Task Summary Sheet (Section II, LOD Sheet)
15
Accept/Re-write Task Action Statement for Use in TLO. Record on LOD Sheet (Section II, LOD Sheet)
16
Accept/Re-write Task Condition Statement for Use in TLO. Record on LOD Sheet. (Section II, LOD Sheet)
17
Accept/Re-write Task Standards Statement for Use in TLO. Record on LOD Sheet. (Section II, LOD Sheet)
18
Obtain Materials for Constructing Learning Pyramids
19
Record Appropriate Information on Learning Pyramid Cards
20
Examine First/Next Task Element on Task Summary Sheet
21
Record Task Element on Learning Pyramid (LP) Card
22
Determine/Record Learning Category/ Subcategory on LP Card
23
Determine Assumed Entry Level Skills & Knowledges of Target Population
24
Perform Learning Analysis on Task Element Using Yellow LP Cards to Record Actual Statements
25
Learning Analysis Performed for All Task Elements ?
No
Go to Block 20
Yes
26
Combine Pyramids for Whole Task and Record Letter/Number on Each LP Card
27
Have Another SME or Supervisor Check Learning Pyramids for Completeness and Accuracy
28
Revise Learning Pyramids as Necessary
29
Examine First/Next Learning Pyramid
30
Record Task Element Action Statement With Number (Section III (A), LOD Sheet)


31
Record Learning Category [Section III (D), LOD Sheet]
32
Record ALL Enabling S&K Shown Under Task Element in Learning Pyramid [Section III (A), LOD Sheet]
33
Have All Learning Pyramids Been Examined ?
No
Go to Block 29
Yes
34
Examine First/Next Task Element or Enabling S&K [Section III (A), LOD Sheet]
35
Determine if Learning Objective (LO) Should be Written
36
Does This Task Element or Enabling S&K Require an LO ?
No
Yes
37
• Record "None" [Section III (B), LOD Sheet] and [LP Card]
• Place Card in Separate Stack
38
Assign and Record a Number [Section III (B), LOD Sheet] [LP Card]
39
Determine/Record Learning Category for Enabling S&K [Section III (D), LOD Sheet] [LP Card]
40
Have All Task Elements and Enabling S&K Been Examined ?
No
Go to Block 34
Yes
41
Examine First/Next Task Element or Enabling S&K That Requires an LO to be Prepared [Section III (A) (B), LOD Sheet]
42
Write an LO Action Statement for Task Element or Enabling S&K
43
Write an LO Conditions Statement for Task Element or Enabling S&K
44
Write an LO Standards Statement for Task Element or Enabling S&K
45
Assess Learning Objective (LO) for Adequacy
46
Revise LO as Necessary
47
Record LO on LOD Sheet [Section III (C), LOD Sheet]
48
All Needed Elements or Enabling S&K Have LO ?
No
Go to Block 41
Yes
49
Have ALL Task Summary Sheets Been Examined ?
No
Go to Block 11
Yes
50
Submit LOD Sheets and LP Cards for Which LOs are Written to Supervisor
51
Any Information for Individuals Working in Other ISD Blocks ?
Yes
No
52
Record Comments on ISD COORDINATION SHEET
STOP

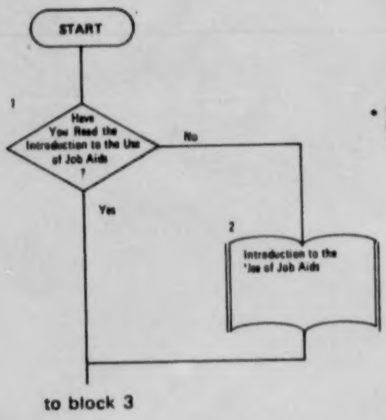
JOB AID FOR
DEVELOPING TESTS

ISD II.2

Manual

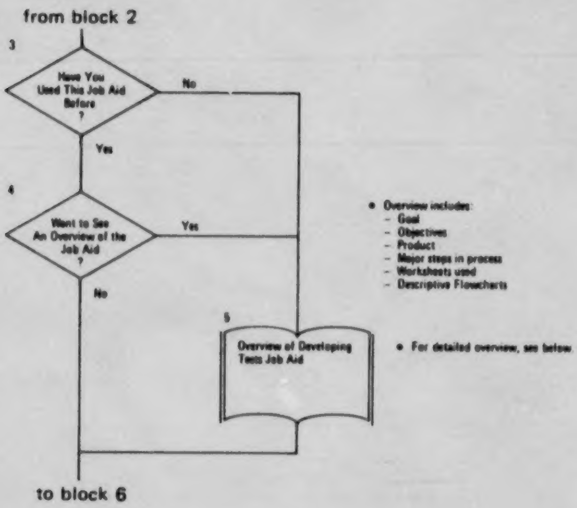
This is the 6th in a series of ISD Job Aids for use in instructional design and development. This volume is to be used as a supplement to the primary document, "Job Aids: Descriptive Authoring Flowcharts ISD II.2 Developing Tests." The flowchart document will direct you to specific guidance, examples, and references provided in this volume. If you do not have the primary flowchart document, request it from your supervisor.

> The wording in this manual should not be construed to discriminate between the sexes. In order to avoid a repetitious use of the terminology, "he/she," the terms, "he," "him," and "his," as well as "men," are intended to include both the masculine and feminine gender. Any exceptions to this usage will be so noted.


START
1
Have You Read the Introduction to the Use of Job Aids ?
No
Yes
2
Introduction to the Use of Job Aids
to block 3

- This introduction provides the user with instruction on the basic structure of the Job Aids and guidance for their use.

- Refer to Introduction.


from block 2
3
Have You Used This Job Aid Before ?
No
Yes
4
Want to See An Overview of the Job Aid ?
Yes
No
5
Overview of Developing Tests Job Aid
to block 6

- Overview includes:
  - Goal
  - Objectives
  - Product
  - Major steps in process
  - Worksheets used
  - Descriptive Flowcharts

- For detailed overview, see below.

What is the Job Aid for "Develop Tests" All About?

- **GOAL**

  – The purpose of this job aid is to guide you in the actual preparation of written test items to test the ability of soldiers to correctly perform critical tasks or task elements. At present the job aid does not cover the development of hands-on tests, nor does it cover preparation of administrative materials or validation of test items. Much of the information contained in this job aid has been taken directly from the document Guidelines for Development of Skill Qualification Tests, US Army Training Support Center, Individual Training Evaluation Directorate, 1 April 1977. While the source document for this job aid deals with SQT, it can be used for developing tests other than SQT. The user of this job aid can supplement the information contained in the job aid by using the very valuable SQT document.

- **OBJECTIVES**

1) Given a list of critical tasks and the associated task analysis data and learning objectives, determine which tasks and task elements should be tested and the means of testing.
2) Given the appropriate worksheets, document the tasks and task elements to be tested and the method to be used for testing.
3) Given the tasks and task elements with the method to be used for testing each identified, develop written test items for those elements identified as being best suited for this method of testing.

- **PRODUCT**

— This job aid will result in the identification of tasks and task elements which require the preparation of test items and the identification of the most suitable method for testing them. For those tasks or task elements for which written test items are judged to be the most suitable testing mode, test items will be prepared.

- **OVERVIEW OF MAJOR STEPS IN DEVELOPING TESTS**

Step 1. Task analysis data and learning objectives for all critical tasks are examined to determine which tasks and task element requires test item preparation.

Step 2. For task elements determined to require testing, the most appropriate method of testing (hands-on, performance-certification, or written) is identified.

Step 3. For all task elements for which a written test item is judged to be the most suitable, the precise type of written item is identified (written-performance or performance-based test item).

Step 4. Written-performance and performance-based test items are prepared.

- **WORKSHEETS USED:**

— The Tables on pages F-6 and F-7 show a sample of the completed Test Element Decision Sheet (TED) and Test Item Construction Sheet (TIC).

- **DESCRIPTIVE FLOWCHART**

— The flowchart on pages F-51 thru F-53 shows the major steps in the use of the Job Aid for Developing Tests. The flowchart will be useful to you in getting a clear picture of the overall process used in this job aid. A more completely described flowchart is provided in Job Aids: Descriptive Authoring Flowcharts ISD II.2 Develop Tests, pages F-3 thru F-14.

ISD II.2 Develop Tests

TEST ELEMENT DECISION SHEET

(TED Sheet)

SECTION I

Name/Office Symbol Brown, Charles SFC/ITAD Date 10/2/79

MOS 51P20 Skill Level 2

Task ID No. 151-010-455 Task Description (Action Statement Only) Set up Field Telephone

SECTION II

(1) Task Element to be Tested (Action Statement Only)	(2) Test Component to Which Assigned
1 Prepare field wire	✓ HOC ☐ PCC ☐ WC ☐ Written Performance ☐ Performance based
2 Install batteries in the TA-312/PT	☐ HOC ☐ PCC ✓ WC ✓ Written Performance ☐ Performance based
3 Secure field wire on the TA-312/PT	☐ HOC ☐ PCC ✓ WC ✓ Written Performance ☐ Performance based
4 Position circuit selector switch	☐ HOC ☐ PCC ✓ WC ✓ Written Performance ☐ Performance based
5 Position buzzer volume control knob	☐ HOC ☐ PCC ✓ WC ✓ Written Performance ☐ Performance based
6 Position the EXT-INT switch	☐ HOC ☐ PCC ✓ WC ✓ Written Performance ☐ Performance based
7	☐ HOC ☐ PCC ☐ WC ☐ Written Performance ☐ Performance based
8	☐ HOC ☐ PCC ☐ WC ☐ Written Performance ☐ Performance based
9	☐ HOC ☐ PCC ☐ WC ☐ Written Performance ☐ Performance based
10	☐ HOC ☐ PCC ☐ WC ☐ Written Performance ☐ Performance based

ISD II.2 Develop Tests

TEST ITEM CONSTRUCTION SHEET

(TIC Sheet)

SECTION I

Name/Office Symbol Brown, Charles SFC/ITAD Date 10/4/79

MOS 51P20 Skill Level 2

Task ID No. 151-010-455 Task Element (Action Statement Only) Install batteries in the TA-312/PT

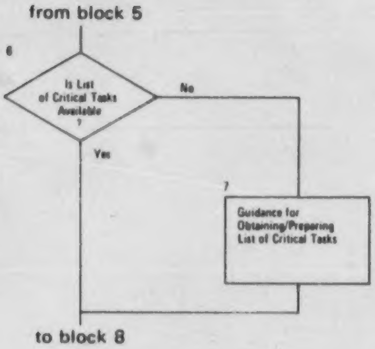
SECTION II

TEST ITEM

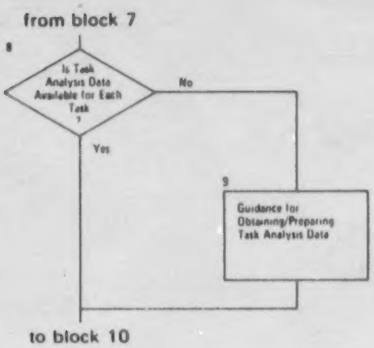
General Situation. Your weapon system is in a fixed defense of an airfield. Communication is by field telephone. Field wire has been laid from switchboard, SB-993/GT to your position. The telephone set, TA-312/PT has just been issued from supply. The power source will be two BA-30 batteries.

How would you install the two batteries in the TA-312/PT?

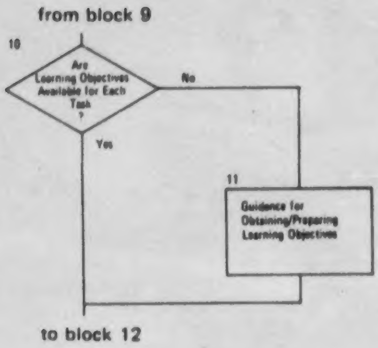
* A. one with positive (electrode) end up, the other with negative (smooth) end up
B. both with positive (electrode) end up
C. both with negative (smooth) end up


from block 5
6
Is List of Critical Tasks Available ?
No
Yes
7
Guidance for Obtaining/Preparing List of Critical Tasks
to block 8

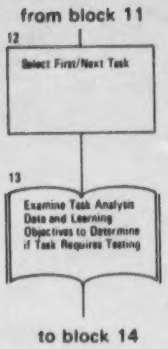
- List of tasks selected for training should be available as output from ISD I.2, Select Tasks for Training.
- If a critical task list is not available, go to Job Aids: Descriptive Authoring Flowcharts, page A-3.
- When list has been obtained return to Manual, ISD I.3 Conduct Task Analysis, Block 6.


from block 7
8
Is Task Analysis Data Available for Each Task ?
No
Yes
9
Guidance for Obtaining/Preparing Task Analysis Data
to block 10

- Task Analysis Data should be available as output from ISD I.3 Conduct Task Analysis or in the Soldier's Manual.
- If Task Analysis Data is not available, go to Job Aids: Descriptive Authoring Flowcharts, page B 1.
- When Task Analysis Data have been obtained, return to Block 8.


from block 9
10
Are Learning Objectives Available for Each Task ?
No
Yes
11
Guidance for Obtaining/Preparing Learning Objectives
to block 12

- Learning Objectives should be available as output from ISD II.1 Develop Objectives.
- If Learning Objectives are not available, go to Job Aids: Descriptive Authoring Flowcharts ISD II.1 Develop Objectives.
- When Learning Objectives have been obtained, return to Block 10.


from block 11
12
Select First/Next Task
13
Examine Task Analysis Data and Learning Objectives to Determine if Task Requires Testing
to block 14

- Factors influencing selection of tasks for testing include:
  - known performance deficiencies
  - critical combat systems
  - ARTEP
  - evaluation results
  - job content
- For further information and guidance, see below.

How Do I Determine Whether a Task Requires Testing?

- It may not be possible for you to test every task in the MOS or skill level you are working with. This will be especially true if the test you are preparing is an SQT where the number of scoreable units is limited. Therefore, you may need to determine which critical tasks require test items to be developed. When making this determination keep in mind that the tasks included in the final test may intentionally not be a random sample of the critical tasks in the MOS, nor necessarily a representative sample of these tasks. The Tasks that you select should be selected in terms of the extent to which they need to be made the focus of training.

- The following five major methods of task selection should be considered:

  (1) Known performance deficiencies
  (2) Critical combat systems
  (3) Army Training and Evaluation Programs (ARTEP)
  (4) Evaluation results
  (5) Job content

  — Known Performance Deficiencies. The purpose of this method is to select tasks that tend to be performed poorly by most soldiers in the MOS. If only one method of task selection could be used, it would most likely be this one. The difficulty with its use is in obtaining sufficient information on which to base judgments. Some of the more generalized sources that should be considered are:

  a. TOE Manpower Authorization Criteria (MACRIT). The US Army Development and Readiness Command maintains a master data file of annual direct productive maintenance man-hours (AMMH) for all standard and limited procurement items of equipment.

  b. Equipment-Maintenance Related Reports and Data.

  c. Technical Proficiency Inspection (TPI) and Technical Standardization Inspections (TSI).

  d. IG Inspections

---

e. Panel of recent supervisors

f. Panel of recent job incumbents

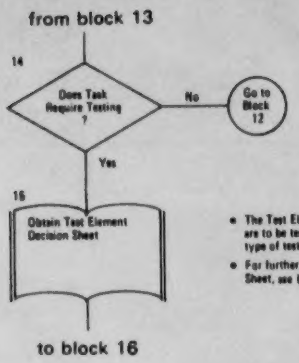
g. Field Survey of supervisors and job incumbents

— Critical Combat Systems. Tasks chosen for testing may be selected on the basis of their contributions to the successful operation or maintenance of critical combat systems. Critical combat systems are equipment items or other operations that are pivotal to a unit's success in combat. To use this method of task selection, first identify the critical combat systems that are related to your MOS, and then identify individual tasks that are directly related to that system.

— ARTEP. The ARTEP, of course, describes unit tasks while your test is based on individual tasks. However, it may be useful for you to consider testing individual tasks that comprise unit tasks or missions in the ARTEP. Look for deficiencies in crew/unit performance that can be translated into individual tasks for use in your test.

— Evaluation Results. The Directorate of Evaluation (DOE) may have valuable data concerning performance deficiencies for many of the critical tasks.

— Job Content. Just as known performance deficiencies are the most desirable tool for task selection, sampling on the basis of job content is probably the least desirable. If the expertise and experience available to you is insufficient to enable you to make judgments as to degrees of criticality for testing, you will probably need to resort to sampling from the critical task list. However, even here the sampling is not done on a simple random basis. Tasks should be organized into content or functional areas and a proportional sample drawn from each.


from block 13
14
Does Task Require Testing ?
No
Go to Block 12
Yes
15
Obtain Test Element Decision Sheet
to block 16

- The Test Element Decision Sheet (TED) is used to record all task elements which are to be tested. In addition, each task element recorded is classified as to the type of test item required to adequately test it.
- For further information and guidance on obtaining the Test Element Decision Sheet, see below.

Where Can I Obtain the Test Element Decision Sheet (TED Sheet)?

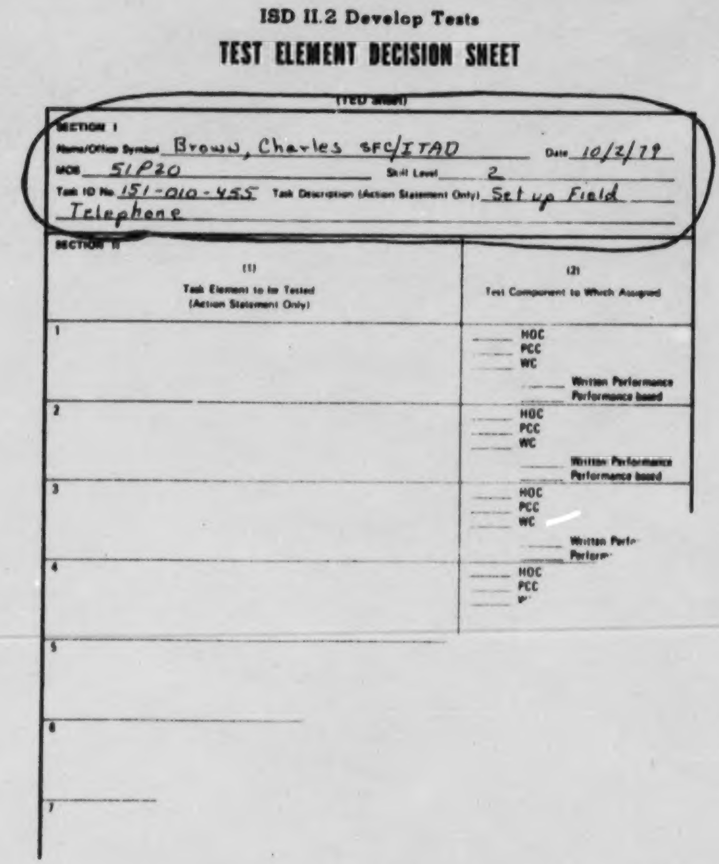
- The Test Element Decision Sheet (TED) is available for duplication in the pocket at the back of this manual.
- To see a partially completed TED Sheet refer to page F-14.

from block 15
16
Complete Section I of TED Sheet
to block 17

- Section I includes the following information:
  - Name/Office Symbol
  - MOS
  - Skill Level
  - Task ID No
  - Task description (action statement only)
- For example, see below.

What Does the TED Sheet Look Like When Section I Has Been Completed?

EXAMPLE:



ISD II.2 Develop Tests

TEST ELEMENT DECISION SHEET

(TED Sheet)

SECTION I

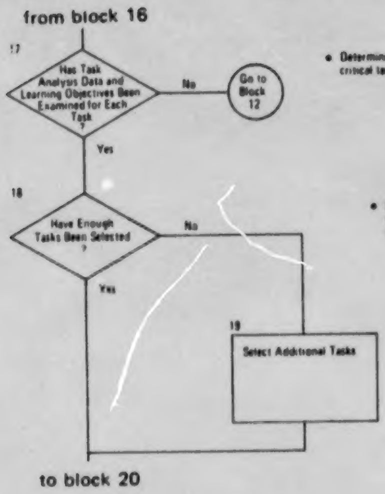
Name/Office Symbol Brown, Charles SFC/ITAD Date 10/2/79

MOS 51P20 Skill Level 2

Task ID No. 151-010-455 Task Description (Action Statement Only) Set up Field Telephone

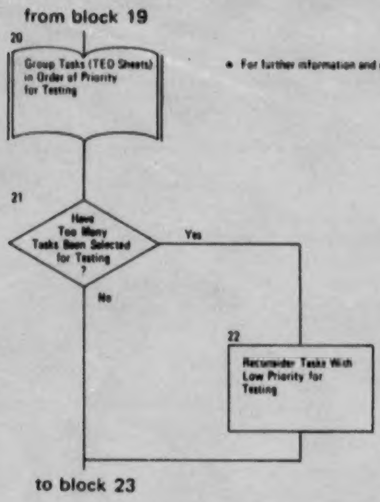
SECTION II

	(1) Task Element to be Tested (Action Statement Only)	(2) Test Component to Which Assigned
1		____ HOC ____ PCC ____ WC ____ Written Performance ____ Performance based
2		____ HOC ____ PCC ____ WC ____ Written Performance ____ Performance based
3		____ HOC ____ PCC ____ WC ____ Written Perfo- ____ Perform-
4		____ HOC ____ PCC ____ W
5		
6		
7		


from block 16
17
Has Task Analysis Data and Learning Objectives Been Examined for Each Task ?
No
Go to Block 12
Yes
18
Have Enough Tasks Been Selected ?
No
Yes
19
Select Additional Tasks
to block 20

- Determination should be complete as to which tasks in the critical task listing require testing.

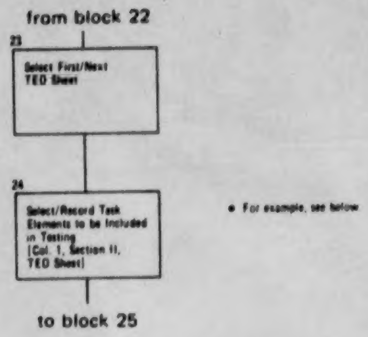
- Supervisors can provide guidance for making this decision. Their decision will be based on the intended purpose of the test.


from block 19
20
Group Tasks (TED Sheets) in Order of Priority for Testing
21
Have Too Many Tasks Been Selected for Testing ?
Yes
No
22
Reconsider Tasks With Low Priority for Testing
to block 23

- For further information and guidance, see below

Why Should I Group the Tasks (TED Sheets) in Order of Priority for Testing?

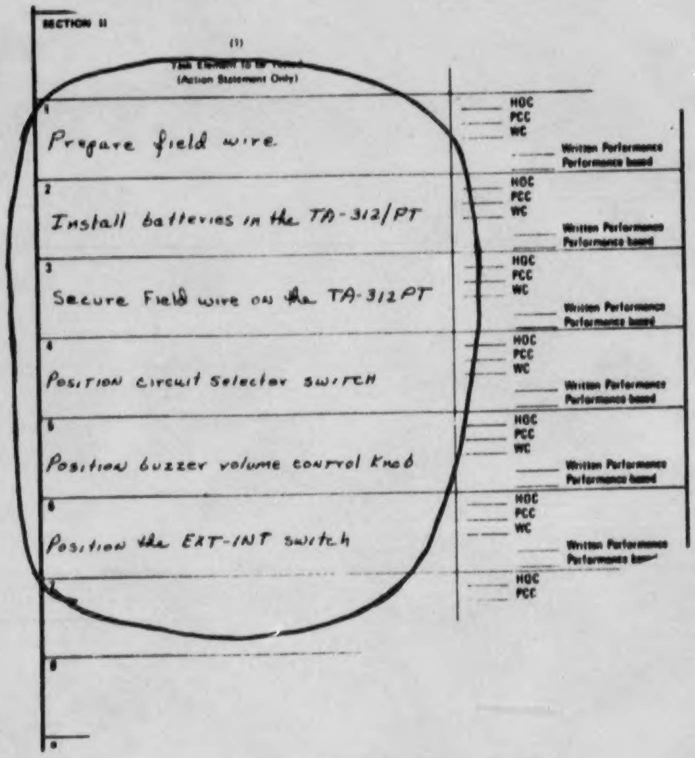
- If you used more than one method or source for task selection, you may, at this point, have an unorganized list of tasks for test item development. If that is so, sort the tasks in a rough order of priority for testing. A major reason for this grouping is that you may have identified tasks that you will want to test regardless of subsequent testing restrictions that you may encounter. For example, your supervisor may have specified tasks that must be tested. You would certainly want to identify these tasks in some manner as have a high priority for testing. You may have other tasks that were identified by less reliable criteria which you may later consider dropping from the test if too many tasks have been selected for testing.


from block 22
23
Select First/Next TED Sheet
24
Select/Record Task Elements to be Included in Testing [Col. 1, Section II, TED Sheet]
to block 25

• For example, see below

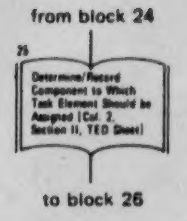
What Does the TED Sheet Look Like When the Task Elements Selected for Testing are Recorded?

EXAMPLE:



SECTION II

	(1) Task Element to be Tested (Action Statement Only)		
1	Prepare field wire.	___ HOC ___ PCC ___ WC	___ Written Performance ___ Performance based
2	Install batteries in the TA-312/PT	___ HOC ___ PCC ___ WC	___ Written Performance ___ Performance based
3	Secure Field wire on the TA-312PT	___ HOC ___ PCC ___ WC	___ Written Performance ___ Performance based
4	Position circuit selector switch	___ HOC ___ PCC ___ WC	___ Written Performance ___ Performance based
5	Position buzzer volume control knob	___ HOC ___ PCC ___ WC	___ Written Performance ___ Performance based
6	Position the EXT-INT switch	___ HOC ___ PCC ___ WC	___ Written Performance ___ Performance based
7		___ HOC ___ PCC	
8			
9			


from block 24
25
Determine/Record Component to Which Task Element Should be Assigned (Col. 2, Section II, TED Sheet)
to block 26

- There are the three following components to which a task element may be assigned
  - HOC (Hands On Component)
  - PCC (Performance Certification Component)
  - WC (Written Component)
- For further information and guidance, see below

What are the Three Components Used for Testing Task Elements?

- In Skill Qualification Tests (SQT) there are three components which comprise the SQT. Even though you may not be developing a SQT it will be useful for you to determine which of these three components is the most desirable and feasible method of testing the task element under consideration. The three components are as follows:
  - Hands-On-Component (HOC). The HOC tests the soldier's ability to perform critical tasks or task elements on actual job equipment or simulators.
  - Performance Certification Component (PCC). Many tasks, or task elements may require the soldier to use manipulative or other motor skills, but these tasks and task elements cannot be included in the HOC because they are so expensive in terms of time, equipment, and other resources. For this reason, if you are developing a SQT you may wish to consider the task element for PCC.
  - Written Component (WC). The WC is a written test made up of scoreable units, with each scoreable unit comprising a critical task. The scoreable unit is usually comprised of up to 10 questions (items), with each question having from 2 to 10 possible responses. The WC is used to test those tasks and task elements requiring decision-making or other mental abilities.

How do I Determine the Component to Which the Task Element Should be Assigned?

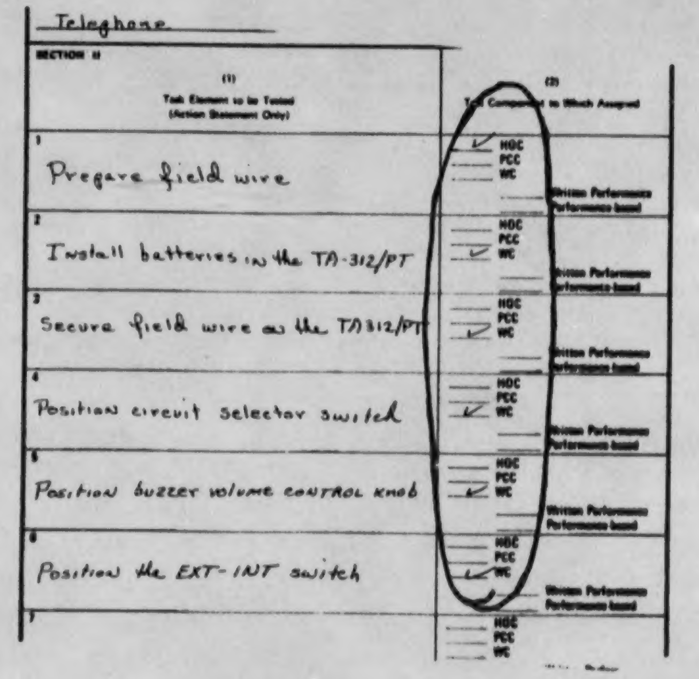
- Tasks and task elements are allocated to components on the basis of task content and testing feasibility. Both concepts assume that you know how the task element being considered is performed. This information can be obtained from a study of the task analysis data.
  - Task Content. This concept involves deciding on the type of task and the degree of skill required for the task element. The skill category to which the task element fits into should be available from output from ISD II.1 Develop Objectives. After determining the skill category of the task element remember that all types and levels of skill can be tested validly in a hands-on mode, assuming unlimited resources. Some physical tasks may be tested in the WC, but highly skilled, physical tasks must be tested in the HOC or PCC. On the other hand, some mental task elements may need to be tested in the HOC, but mental tasks and task elements are usually more amenable to variations that permit written testing.
  - Testing Feasibility. Any testing requires some resources. The WC is usually the least demanding because many soldiers can be tested on many tasks, or task elements, in a relatively short time with one test administrator. However, the support of some tasks may be unfeasible in the WC because of requirements for equipment, complete publications, etc. The HOC will always require equipment, terrain and several qualified scorers. In addition, relatively few tasks in the HOC can be tested in a short time. The PCC was set up to accommodate tasks that are extremely time consuming and that require special terrain, facilities, or expensive equipment.
- After studying the task element content and testing feasibility, assign the task element to one of the three components (HOC, PCC or WC). Remember the following when making the assignment:
  - If there are no parts of the task element that involve highly skilled physical actions, the task element should be considered for the WC.
  - If the skill is almost entirely mental, the task element should be considered for the WC.
  - All highly skilled physical elements that can be tested feasibly in the HOC should be considered for allocation to this component.

Where do I Record the Component Assigned to the Task Element?

- In Column 2, Section II of the TED Sheet there are blanks for each of the three components. Place a check (✓) in the appropriate blank.

What Does the TED Sheet Look Like After I Have Recorded the Component to Which the Task Element has Been Assigned?

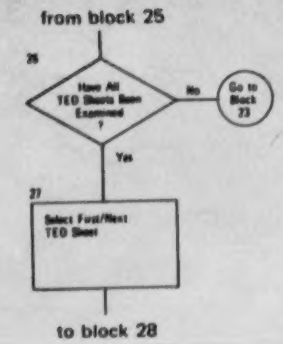
EXAMPLE:

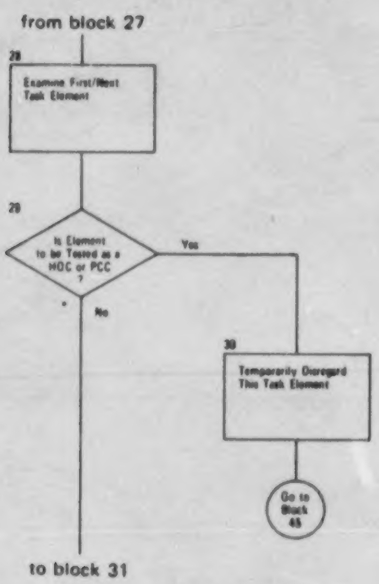


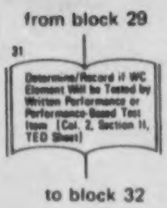
Telephone

SECTION II

(1) Task Element to be Tested (Action Statement Only)	(2) Task Component to Which Assigned
1 Prepare field wire	✓ HOC ___ PCC ___ WC ___ Written Performance ___ Performance based
2 Install batteries in the TA-312/PT	___ HOC ___ PCC ✓ WC ___ Written Performance ___ Performance based
3 Secure field wire on the TA312/PT	___ HOC ___ PCC ✓ WC ___ Written Performance ___ Performance based
4 Position circuit selector switch	___ HOC ___ PCC ✓ WC ___ Written Performance ___ Performance based
5 Position buzzer volume control knob	___ HOC ___ PCC ✓ WC ___ Written Performance ___ Performance based
6 Position the EXT-INT switch	___ HOC ___ PCC ✓ WC ___ Written Performance ___ Performance based
7	___ HOC ___ PCC ___ WC


from block 25
26
Have All TEO Sheets Been Examined ?
No
Go to Block 23
Yes
27
Select First/Next TEO Sheet
to block 28


from block 27
28
Examine First/Next Task Element
29
Is Element to be Tested as a HOC or PCC ?
Yes
No
30
Temporarily Disregard This Task Element
Go to Block 45
to block 31


from block 29
31
Determine/Record if WC Element Will be Tested by Written Performance or Performance-Based Test Item (Col. 2, Section II, TED Sheet)
to block 32

- For further information and guidance, see below

What is a Written-Performance Test Item and a Performance-Based Test Item?

- The WC utilizes two modes of testing: the written-performance mode and the performance-based mode. Each task element allocated to the WC is testable in one of these modes.
  - — A written-performance test item measures the examinee's ability to actually perform the task element. Examinees perform whatever steps are necessary to arrive at the task product, and then based upon this product, select correct answers from the real-world alternatives presented. For example, a written-performance item might require that the examinee compute the charge for a 4.2-mortar round. Examinees would actually have to perform the task to be able to select the right answer from the alternatives.
  - — A performance-based test item measures the examinee's ability to answer questions about how he would perform the task element. For example, an examinee might be asked to identify before-operations maintenance checks from a larger list of maintenance checks.
- A good rule of thumb to use in distinguishing between written-performance and performance-based written items is to ask yourself, "Does the item call for the soldier to perform the task or task element as he would perform it on the job, or does the item call for him to answer questions about how he would perform it?"

How do I Determine if the Task Element Should be Tested by a Written-Performance or Performance-Based Test Item?

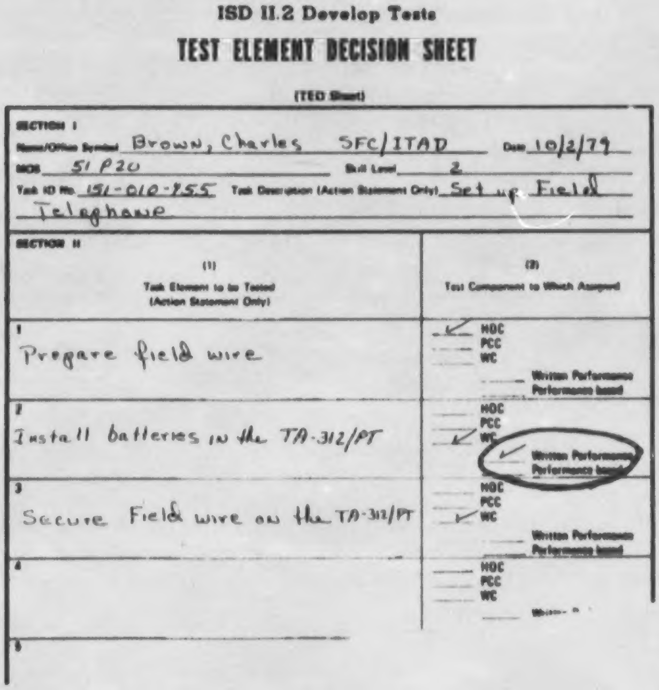
- Study the definitions above. Written performance testing should be used whenever applicable. Use performance-based testing only after it has been determined that written-performance testing is not applicable.

Where do I Record Whether the Task Element Will be Tested by a Written-Performance or a Performance-Based Test Item?

- Check the appropriate blank in Column 2, Section II of the TED Sheet.

What Does the TED Sheet Look Like After I Have Recorded How the Task Element Will be Tested?

EXAMPLE:



ISD II.2 Develop Tests

TEST ELEMENT DECISION SHEET

(TED Sheet)

SECTION I

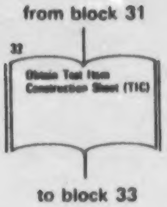
Name/Office Symbol Brown, Charles SFC/ITAD Date 10/2/79

MOS 51 P20 Skill Level 2

Task ID No. 151-010-955 Task Description (Action Statement Only) Set up Field Telephone

SECTION II

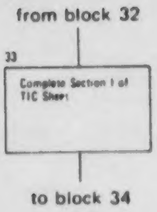
(1) Task Element to be Tested (Action Statement Only)	(2) Test Component to Which Assigned
1 Prepare field wire	✓ HOC PCC WC Written Performance Performance based
2 Install batteries in the TA-312/PT	HOC PCC ✓ WC [✓ Written Performance] Performance based
3 Secure Field wire on the TA-312/PT	HOC PCC ✓ WC Written Performance Performance based
4	HOC PCC WC
5	


from block 31
32
Obtain Test Item Construction Sheet (TIC)
to block 33

- For guidance in obtaining Test Item Construction Sheet (TIC), see below.

Where Can I Obtain the Test Item Construction Sheet (TIC Sheet)?

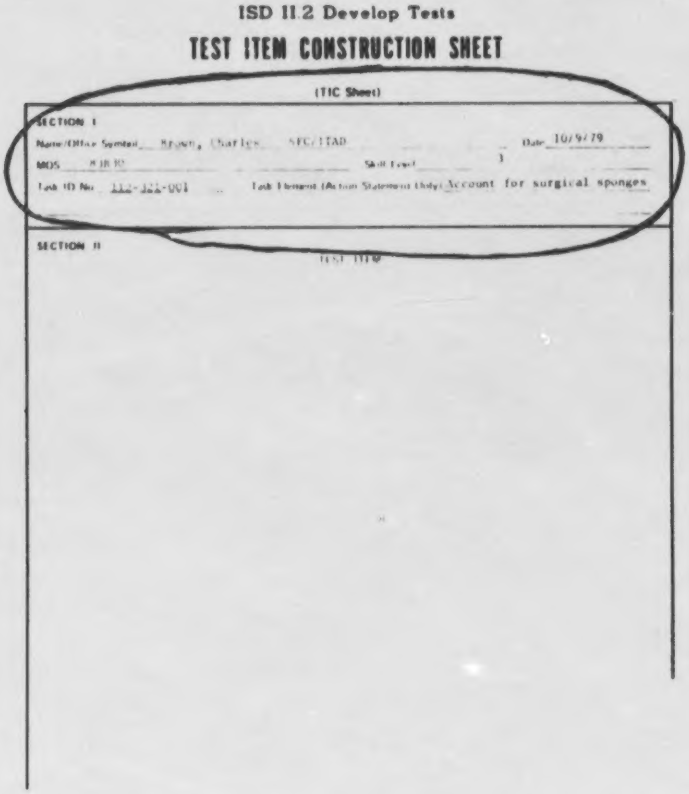
- **The Test Item Construction Sheet (TIC) is available for duplication in the pocket at the back of this manual.**
- **To see a completed TIC Sheet refer to page F-7.**


from block 32
33
Complete Section I of TIC Sheet
to block 34

- The information required in Section I is:
  - Name/Office Symbol
  - Date
  - MOS
  - Skill Level
  - Task ID No
  - Task Element (action statement only)
- For example, see below

What Does the Test Item Construction Sheet (TIC) Look Like After Section I Has Been Completed?

EXAMPLE:



ISD II.2 Develop Tests

TEST ITEM CONSTRUCTION SHEET

(TIC Sheet)

SECTION I

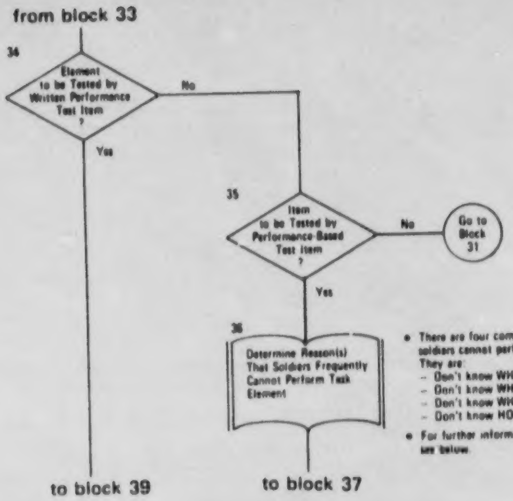
Name/Office Symbol Brown, Charles SFC/ITAD Date 10/9/79

MOS [illegible] Skill Level 1

Task ID No. 111-321-001 Task Element (Action Statement Only) Account for surgical sponges

SECTION II

TEST ITEM


from block 33
34
Element to be Tested by Written Performance Test Item ?
No
Yes
35
Item to be Tested by Performance-Based Test Item ?
No
Go to Block 31
Yes
36
Determine Reason(s) That Soldiers Frequently Cannot Perform Task Element
to block 39
to block 37

- There are four common reasons why soldiers cannot perform a task element. They are:
  - Don't know WHERE to perform
  - Don't know WHEN to perform
  - Don't know WHAT the product is
  - Don't know HOW to perform the procedure
- For further information and guidance, see below.

What Are the Reasons That Soldiers Frequently Cannot Perform the Task Element?

There are four main categories of reasons why a soldier may fail to perform a task or task element. They are:

(1) Don't know WHERE to perform

(2) Don't know WHEN to perform

(3) Don't know WHAT the product is

(4) Don't know HOW to perform procedure

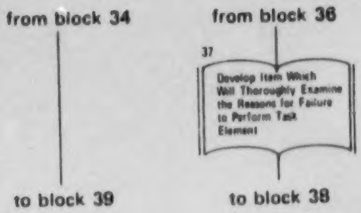
- Don't Know WHERE to Perform. The failure to perform some tasks may be due to the inability to locate certain objects. For example, a vehicle driver may fail to perform checks on preventive maintenance on the component of a vehicle because he does not know where that component is located. A mechanic may fail to zero a multimeter because he does not know the location of the correct adjustment screw.

- Don't Know WHEN to Perform Step. A major reason for failure to perform a task is that the soldier may not know when in a sequence of activities the step should be performed. For example, it is physically possible to remove the hand guards on the M16 rifle at almost any time during assembly. However, there is a point in the sequence when this step should be performed if the soldier is to avoid damaging the weapon.

- Don't Know WHAT the Product is. Another reason for failure to correctly perform a task or task element is that the individual may not know what the end result of the element or step should look like. For example, a clerk cannot type a correct address label unless he knows how a proper address is formatted. A gunner cannot obtain a proper sight picture unless he recognizes the sight alignment when he sees it.

- Don't Know HOW to Perform Procedure. The final consideration for why soldiers cannot perform has to do with procedure. Soldiers may know where and when to perform a step, and what the correct result is, but they may not know how to produce that result—that is, how to execute the step. Procedural failures may result because the soldier simply does not know what the procedure is or because he forgets it. For example, in preparing a LAW for firing, one of the steps is to extend the launcher tube. The soldier may know that the tube must be extended prior to firing and where the tube is located and what the LAW would look like with the tube extended. But unless he knows how to extend the tube, he cannot perform the task.

Study each of the four reasons for failure to perform a task or task element. Determine which reason best explains a failure to perform the task element you are presently considering. In the next block you will prepare a test item which will assure that a failure to perform the task element is identified through use of the test item.


from block 34
to block 39
from block 36
37
Develop Item Which Will Thoroughly Examine the Reasons for Failure to Perform Task Element
to block 38

- For guidance in preparing test item, see below

How do I Develop a Test Item Which Will Thoroughly Examine the Reasons for Failure to Perform the Task Element?

- Based on the determination made in the preceeding block develop a test item to test WHERE, WHEN, WHAT, or HOW to perform the task element. Use the following guidelines.

Don't Know WHERE to Perform

– Identify the Correct Location. This is simply deciding what the right answer is. It may be necessary to actually view the equipment if the element is equipment-oriented. Technical manuals may not have a clear picture or a clear description. Be alert for TM which may be in error.

– Can Photographs show the Item and the Surrounding? It may be possible to show locations by the use of photographs. In fact, clear photos approximate the job presentation closer than any other two-dimensional means. If photos are not practical, consider other visual means such as drawings or schematics. Insure that the photo or drawing is properly keyed.

– Produce Description of Location. If the surroundings of the component cannot be clearly and accurately illustrated in a picture or visual representation, then the location of the component should be described as clearly as possible.

– Write Question for Location. Develop a question which will thoroughly examine the reasons for failure to locate the component. For example, with a keyed picture of a multimeter, the question might be: "Which letter in figure ___ represents the location of the zero adjusting screw?" Or if there is no illustration, the question might be: "Which of the following best describes the location of the zero adjusting screw on the multimeter?"

- **Select Real World Alternatives.** Consider the likely options which you would find on the job. Select from or use these options (no more than nine since there should not be more than ten responses per question) as alternatives to the correct answer. The types of alternatives selected will vary, depending on whether the item uses visual or verbal information. For a given item, the number of alternatives selected is not important. It is important, however, that the alternatives are reasonable and realistic in terms of errors that commonly occur in the real world.

Don't Know WHEN to Perform

- Identify the Correct Step/Sequence. This means identifying the correct point in the sequence for performing the step

- Write Question for Sequence. Develop a question that will thoroughly examine the reasons for failing to perform this step in sequence. The question might be phrased this way: "Which of the following steps must be performed before . . .?" or, "Which of the following steps must not be performed until . . .?" If the problem is one of soldiers performing the step, but at the wrong point in the task, the step may be given either in the question or as one of the alternatives. But if the problem is one of soldiers leaving the step out, it would be better to offer it as an alternative while referring to a preceding (or succeeding) step in the question.

- Select Real World Alternatives. Identify reasonable alternatives that the soldier would find on the job. Select alternatives with emphasis on those variations which include adjacent steps. Remember that the alternatives (plus the correct answers) are limited to 10 selections.

Don't Know WHAT the Product Is

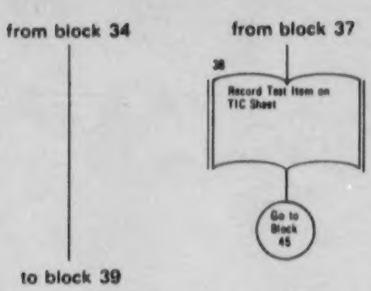
- Identify the Correct Product. The first step is to correctly identify what the correct outcome, result, or product of the step is.
- Is the Ability to "Read" the Product Needed? In determining whether or not the correct product has been obtained, an individual may be required to judge or interpret diagrams, meter readings, aerial photographs, charts, position settings, or other similar visual representations. If these kinds of things are used in determining whether or not the step has been completed, then pictures or visual representations should be used in the test items.
- Prepare Description of the Product. If the product cannot be represented by some visual means, it will be necessary to write out a description of the product. Insure that the description contains the discriminating cues that the soldier mentally uses on the job. For example, "needle reading is in the green area" or "the dial is rotated until the detent is engaged."
- Write Question for Product. Develop a question which will thoroughly examine the reasons for failing to produce (identify) the correct product. This question should center around the scope and basic content of what the correct product is. For example, "Which of the following pictures shows the correct sight alignment for the M16?" or, "When conducting an operational check of the field telephone, the LOUD switch should be in which of the following positions?"
- Select Real World Alternatives. Identify all of the reasonable variations and errors which could be expected to occur on the job. Select the alternatives from these common errors which would lead to failure to produce/identify the correct product. The alternatives selected should reflect the more critical errors if more than nine are identified.

Don't Know HOW to Perform Procedure

- Identify the Correct Procedure. As with all reasons for failure, the first step is to identify the correct way to perform the element.

- Write Question for Procedure. Develop a question which will examine the reasons for failing to perform the procedure correctly. Several approaches are possible. The soldier may be asked to select correct steps from several presented, to place steps in sequence, or to judge a series of photographs as to their correctness.

- Select Real World Alternatives. Select the nine (or less) responses as alternatives that reflect the most likely incorrect actions that the soldier would take on the job.



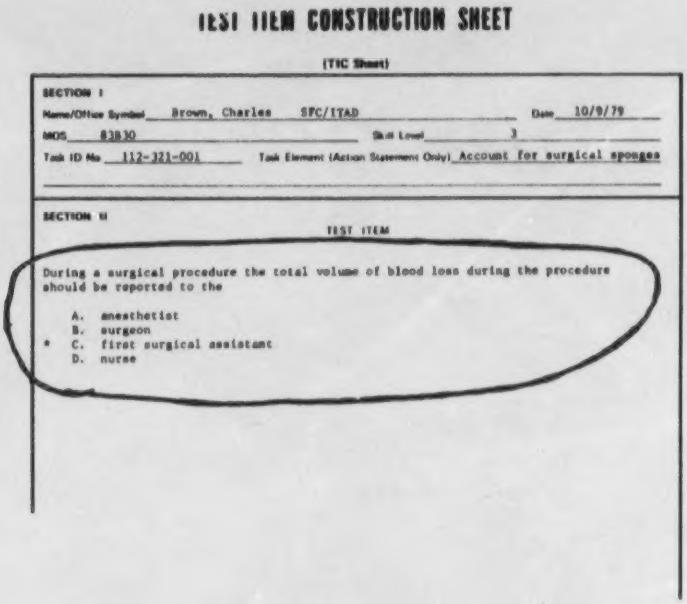
- For guidance and an example of a recorded test item, see below.

Where on the TIC Sheet is the Performance-Based Test Item Recorded?

- The performance-based test item that you have developed is recorded in Section II of the TIC Sheet. If there is any photographs, drawings, etc. associated with the test item, be certain that it (they) is attached to the TIC Sheet.

What Does the TIC Sheet Look Like When the Performance-Based Test Item Has Been Recorded?

EXAMPLE:



TEST ITEM CONSTRUCTION SHEET

(TIC Sheet)

SECTION I

Name/Office Symbol Brown, Charles SFC/ITAD Date 10/9/79

MOS 83B30 Skill Level 3

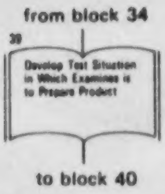
Task ID No 112-321-001 Task Element (Action Statement Only) Account for surgical sponges

SECTION II

TEST ITEM

During a surgical procedure the total volume of blood loss during the procedure should be reported to the

A. anesthetist
B. surgeon
* C. first surgical assistant
D. nurse


from block 34
39
Develop Test Situation in Which Examinee is to Prepare Product
to block 40

- For information and guidance in developing test situation, see below.

How do I Determine the Test Situation in Which the Examinee is to Prepare the Product?

- Whether preparing a test item for an element or an entire task, you begin development by describing the job situation. This description of the job situation may apply to several test items, or it may apply to only one item. In Example 1, below, a test situation is shown which applies to two questions concerned with computing measures of central tendency.

EXAMPLE 1

Situation: You are an instructor at the US Army Signal School. You have just completed the scoring of a test which resulted in the following scores. Your branch supervisor has instructed you to compute the mean and median.

Soldier	Test Score
Alberta	34
Wakelin	35
Braddoch	10
Heyman	45
Holmes	34
Robinson	30
Monday	61
Poole	67
Hermansen	81
Crisler	10
King-Meese	10

1. What is the mean?	2. What is the median?
A. 39	A. 44
B. 34	B. 45
C. 10	C. 30
D. 35	D. 47.5
E. 81	E. 71
F. 67	F. 41.8
G. 38	G. 34
H. 45	H. 35
I. 61	I. 34.5
J. 41.8	J. 10

- The test situation should provide much of the information necessary to formulate the question(s) you are going to ask. While all necessary information pertaining to task conditions and the job setting must be included, avoid information that is unnecessary to task, or task element performance since it consumes valuable testing time.

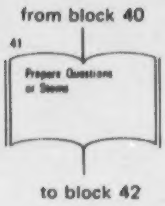
- If a test situation has not already been developed that applies to the task element you are preparing a test item for, use the information above to prepare a needed test situation. Jot the test situation down on a piece of scrap paper for the present. You will later record it on the TIC Sheet.

from block 39
40
Determine if Job Stimulus Conditions Must be Reflected in Test Item
to block 41

- For information and guidance in determining if job stimulus conditions must be reflected in test item, see below.

How do I Determine if the Job Stimulus Conditions Must be Reflected in the Test Item?

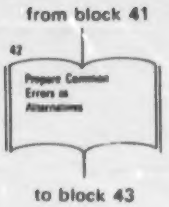
- For some tasks, or task elements, the job stimulus conditions may be transient. That is, some things the soldier must observe, listen to, or otherwise sense in a job setting may be present for only a brief time. Examples are—
  (1) A passing aircraft that must be identified.
  (2) A briefly exposed tank that must be judged friendly or enemy.
  (3) An incoming radio message to be recorded.
- It is important that you recognize when such transient stimuli are part of the task conditions since it will make a difference in how you present the stimulus in the test item you are preparing.
- Examine the task element for which you are preparing the test item. Use the following guidelines when preparing the item:
  - If the stimulus condition is transient, you must attempt to control its presentation to the examinee by use of slides, videotape, or audio recordings. Although the form of the stimulus will be simulation (a picture or recorded sound), you can limit its exposure time to that which would occur in the job situation.
  - If the stimulus condition(s) is/are not transient, but is/are relatively constant in the sense of being present for the soldier to react to or operate on, then it/they should be presented in the test item or as a supplement to it. The stimulus can be presented as a narrative description, a picture or diagram, an actual document, or a simulative device. Examples are—
    (1) Distance on a map - 25 kilometers
    (2) Range to a target - 1500 meters
    (3) Eligibility for overseas levy - yes
    (4) Readiness status of a piece of equipment - RED
- Prepare/collect any needed slides, videotape, picture, diagram etc.



- For information and guidance in preparing questions or stems, see below.

How do I Prepare the Question or Stem?

- Once you have specified the product of the task element, you can prepare a clear question to be asked or statement to be completed (stem). In testing a task element, the question may have to be preceded by a further narrowing of the general test situation already prepared; that is, a specific situation. The specific situation and/or question should make it clear to the soldier just what he is to produce. Examples are—
  - "After you return from point C your squad leader gives you a mission to reconnoiter the bridge site at point C. Using the grid-magnetic angle shown below, what is the magnetic azimuth you will be using?"
  - "What is the ground distance from point A to grid coordinate EG 158858?"
- Jot the question or stem down on a scrap of paper. You will record it on the TIC sheet in a later block.



- For information and guidance, see below

How do I Determine the Alternatives to the Correct Answer to the Test Item?

- For most test items there should be no more than 10 possible answers to the item (9 alternatives and the correct answer). Actually, for many items the number of possible answers will be much fewer than 10. In any event, if your test item is to be used in a test other than SQT try to limit the number of possible answers to 10. If it will be used in SQT you must limit it to a maximum of 10 since the SQT answer sheet provides for no more than 10 possible answers.

- The first step in preparing alternatives is to identify incorrect products that often result in real-world performance of the task or task element. These will be used as alternatives to the correct answer in the multiple-choice question. There is not a certain number of alternatives that should be used in an item except for the limitation discussed above. The number of alternatives should be determined by the number of different errors that commonly occur in the real world. Do not simply generate alternatives mechanically, but check to make sure they are reasonable options. For example, in measuring the distance along a route on a map, the straight line distance (ignoring curves in the route) would be one common error leading to an incorrect product. Using the scale of miles, rather than meters, in converting the measurement to meters might be another common error to use in identifying an incorrect answer alternative. In the rare instance where more than nine common errors occur on the job, you should reduce them to nine or fewer on the basis either of how frequently each occurs in the real world or how critical each error is.

- Jot your answer alternative down on a scrap piece of paper. They will be recorded in a later block.

from block 42
43
Make Provisions for Needed Tools, Aids or References
to block 44

- For information and guidance, see below

How do I Determine if Tools, Job Aid, or References are Needed?

- If tools, job aids, or references are necessary or considered acceptable in performing the task, they should be made available on the test. You should consider the possibility of using a simulation of the tool or aid if it is not feasible to provide the actual one. If being able to locate information in a set of references was previously identified as an essential element, the manuals or references should be provided. If it is not feasible to provide the actual references, extracts of the material should be provided to permit an evaluation of that portion of the essential element dealing with the interpretation and use of the information. Examples are—

  (1) Protractor, compass for map-using.

  (2) TM or extracts from TM.

- Some cautions are necessary when considering references.

  — It is seldom possible to provide each examinee with a copy of a particular TM or other reference. The most feasible method of providing references is through use of extracts. If you are developing an SQT, a maximum of 30 pages of extracts per test can be printed unless justification for an exception is obtained from ITED.

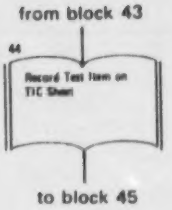
  — Limit reference extracts to situations where the ability or necessity to use the information is the critical element.

  — References cannot be provided for every test item, nor is a reference needed just because it exists. You must consider the job requirements. For example, the procedure for clearing a misfired round is contained in the TM, yet the soldier does not refer to the TM when a misfire occurs. You must decide what material the soldier in the MOS and skill level is expected to know.

  — Do not discard the idea of a reference just because some soldiers in the MOS (usually "experts") can perform the task without use of a reference. This could lead to claims of "foul" on the part of less-skilled examinees who feel they have been discriminated against by the lack of references which are authorized and routinely used (by them, anyway) on the job.

- Some references published by commercial industry, developers, or even individual authors are copyrighted. Section IV, chapter 1, AR310-1 specifies the procedure for dealing with copyrighted material and how to obtain clearance for use.

- If you determine that tools, job aids, or references are needed for using the test item, make provision for obtaining them.



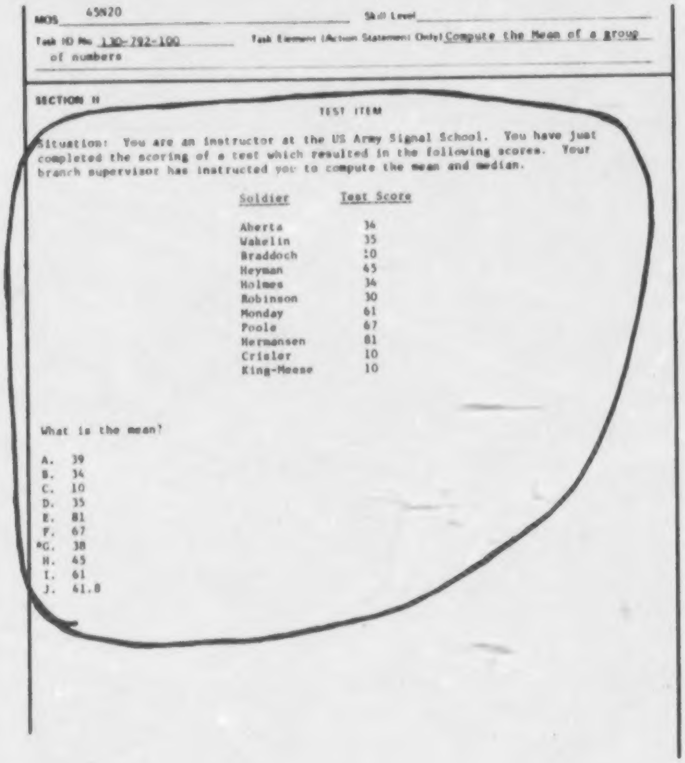
- For guidance and an example of a recorded test item, see below.

How do I Record the Test Item on the TIC Sheet?

- In blocks 39 thru 43 of this job aid you have collected scraps of paper and collected needed tools, aids and references. In this block you will incorporate this material into a test item which will adequately test the examinee's ability to perform the task element. Prior to the actual recording of the test item on the TIC Sheet make one final draft in which you incorporate the test situation, test question or stem, answer alternatives, and any needed references, aids or tools. Review the draft item to be certain that all parts of the item communicates to the examinee. Be concerned with the following:
    - In some of the more technical areas, there is a tendency to try to simplify technical items during the development of items. When this is done, however, the item may lose its intended meaning. Technical terms used on the job by the examinee have very precise meanings. If they are used routinely on the job, they probably should not be changed or "simplified" for the test. **All test material should be written in the normal job language and reviewed and revised until they pass this checkpoint.**
    - Is the test item independent of other test items? Check to be certain that the stem for one item does not give away the answer to another item. An examinee who reads the stem to an item should not be able to work backwards and correct a previous answer.
- After you have prepared the draft test situation, question, alternatives, etc. and have reviewed them for adequacy, record the test item in Section II of the TIC Sheet.

What Does the TIC Sheet Look Like After the Written-Performance Test Item Has Been Recorded?

EXAMPLE:



MOS 45N20 Skill Level

Task ID No. 130-792-100 Task Element (Action Statement Only) Compute the Mean of a group of numbers

SECTION II

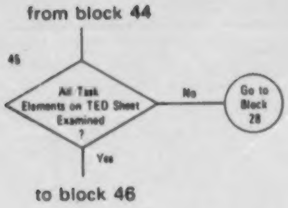
TEST ITEM

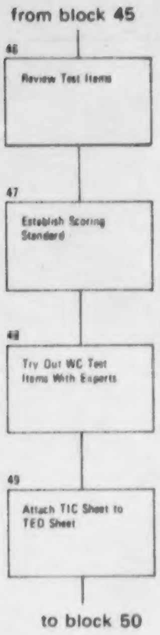
Situation: You are an instructor at the US Army Signal School. You have just completed the scoring of a test which resulted in the following scores. Your branch supervisor has instructed you to compute the mean and median.

Soldier	Test Score
Aherta	36
Wahelin	35
Braddoch	10
Heyman	45
Holmes	34
Robinson	30
Monday	61
Poole	67
Hermansen	81
Crisler	10
King-Moese	10

What is the mean?

A. 39
B. 34
C. 10
D. 35
E. 81
F. 67
*G. 38
H. 45
I. 61
J. 41.8

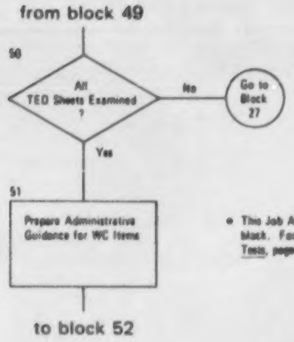

from block 44
45
All Task Elements on TED Sheet Examined ?
No
Go to Block 28
Yes
to block 46


from block 45
46
Review Test Items
47
Establish Scoring Standard
48
Try Out WC Test Items With Experts
49
Attach TIC Sheet to TED Sheet
to block 50

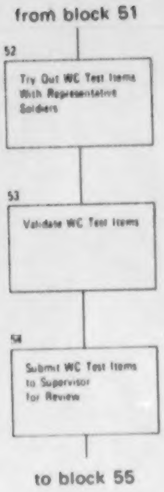
- Test items are reviewed for completeness and accuracy.

- This Job Aid does not presently provide guidance for completing this block. For guidance see, Guidelines for Development of Skill Qualification Tests, page 159.

- This Job Aid does not presently provide guidance for completing this block. For guidance see, Guidelines for Development of Skill Qualification Tests, pages 163-169.

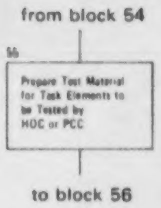

from block 49
50
All TED Sheets Examined ?
No
Go to Block 27
Yes
51
Prepare Administrative Guidance for WC Items
to block 52

- This Job Aid does not presently provide guidance for completing this block. For guidance see, Guidelines for Development of Skill Qualification Tests, pages 171-178.

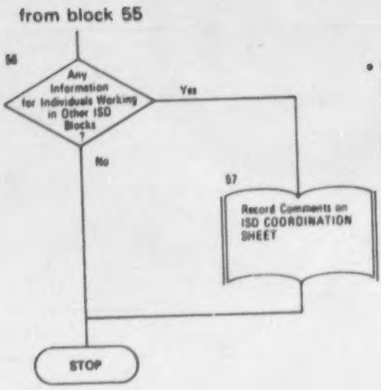

from block 51
52
Try Out WC Test Items With Representative Soldiers
53
Validate WC Test Items
54
Submit WC Test Items to Supervisor for Review
to block 55

- This Job Aid does not presently provide guidance for completing this block. For guidance see, Guidelines for Development of Skill Qualification Tests, pages 180-181.

- This Job Aid does not presently provide guidance for completing this block. For guidance see, Guidelines for Development of Skill Qualification Tests, pages 182-212.


from block 54
55
Prepare Test Material for Task Elements to be Tested by HOC or PCC
to block 56

- This Job Aid does not presently provide guidance for completing this block. For guidance see, Guidelines for Development of Skill Qualification Tests, pages 38-125.


from block 55
56
Any Information for Individuals Working in Other ISD Blocks ?
Yes
No
57
Record Comments on ISD COORDINATION SHEET
STOP

- During the process of developing test items information may have been obtained that would be useful to persons who performed activities that fed into this block. Similarly, information may have been obtained that would be useful to persons who will be engaged in Instructional Systems Development steps that follow this one.

- Comments are recorded and submitted to appropriate persons.
- For further guidance, see below.

What is the importance of preparing comments for people working in other steps of the instructional systems development process? How do I record them?

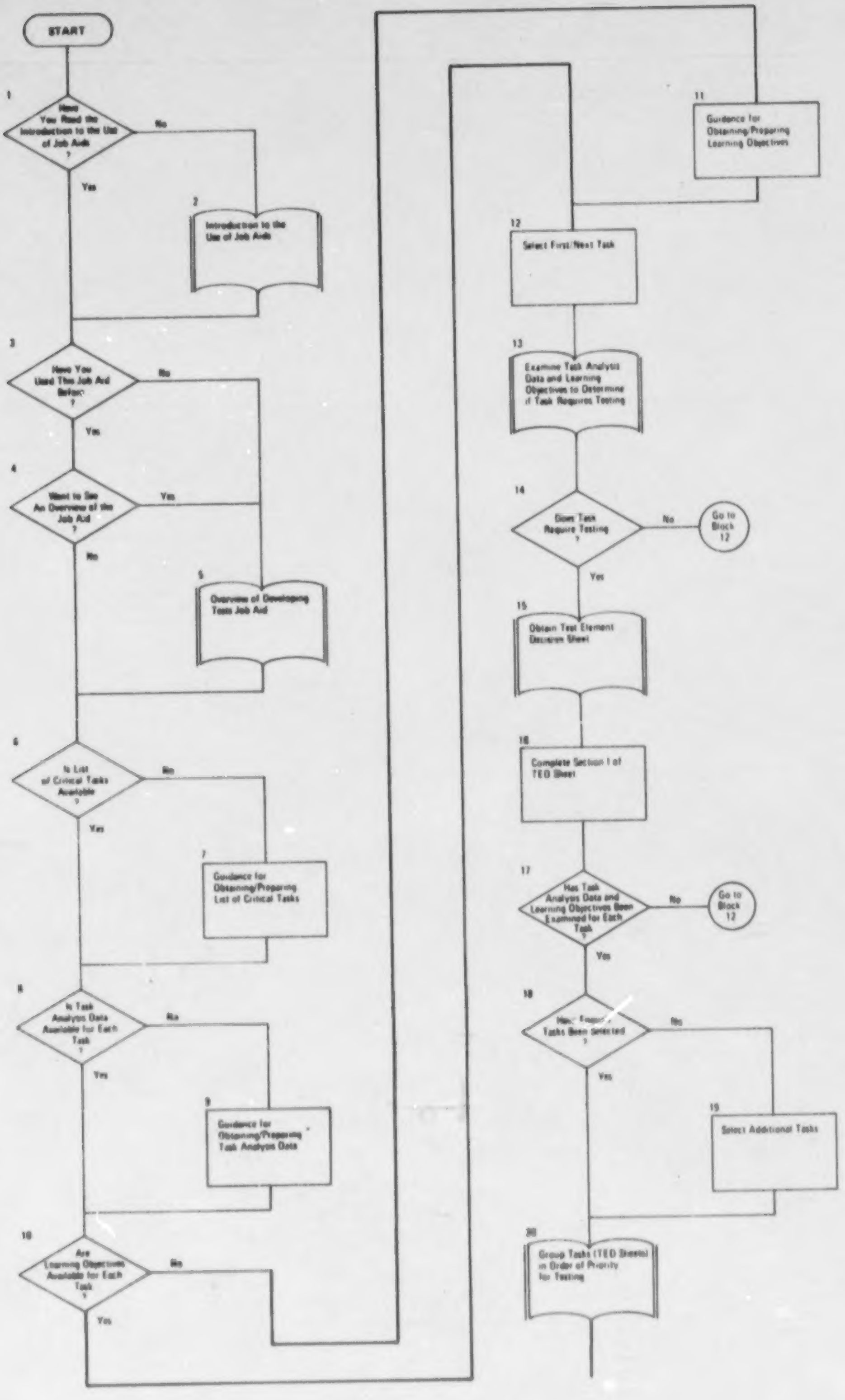
- In order for the Instructional Systems Development process to work effectively it is imperative that there be forward and backward communication between the people involved in the process. At some time or other you have probably complained about the input that has been provided to you. Sometimes, you may have had to do work that should have been performed in previous steps.

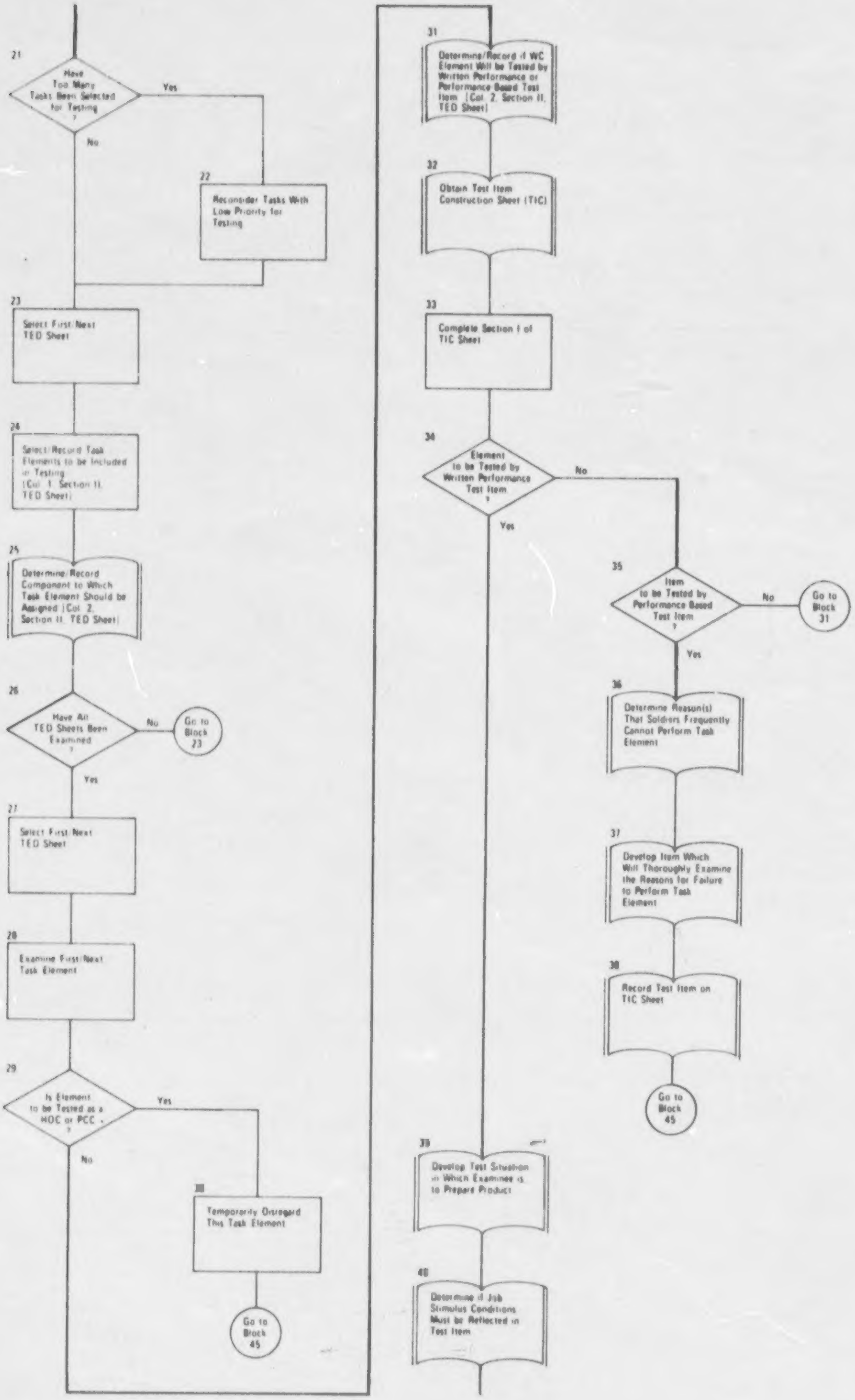
IT IS IMPORTANT THAT YOU FEED THIS INFORMATION BACK TO THE APPROPRIATE PEOPLE SO THAT REVISIONS CAN BE MADE TO EFFECT IMPROVEMENT IN THE END PRODUCT.

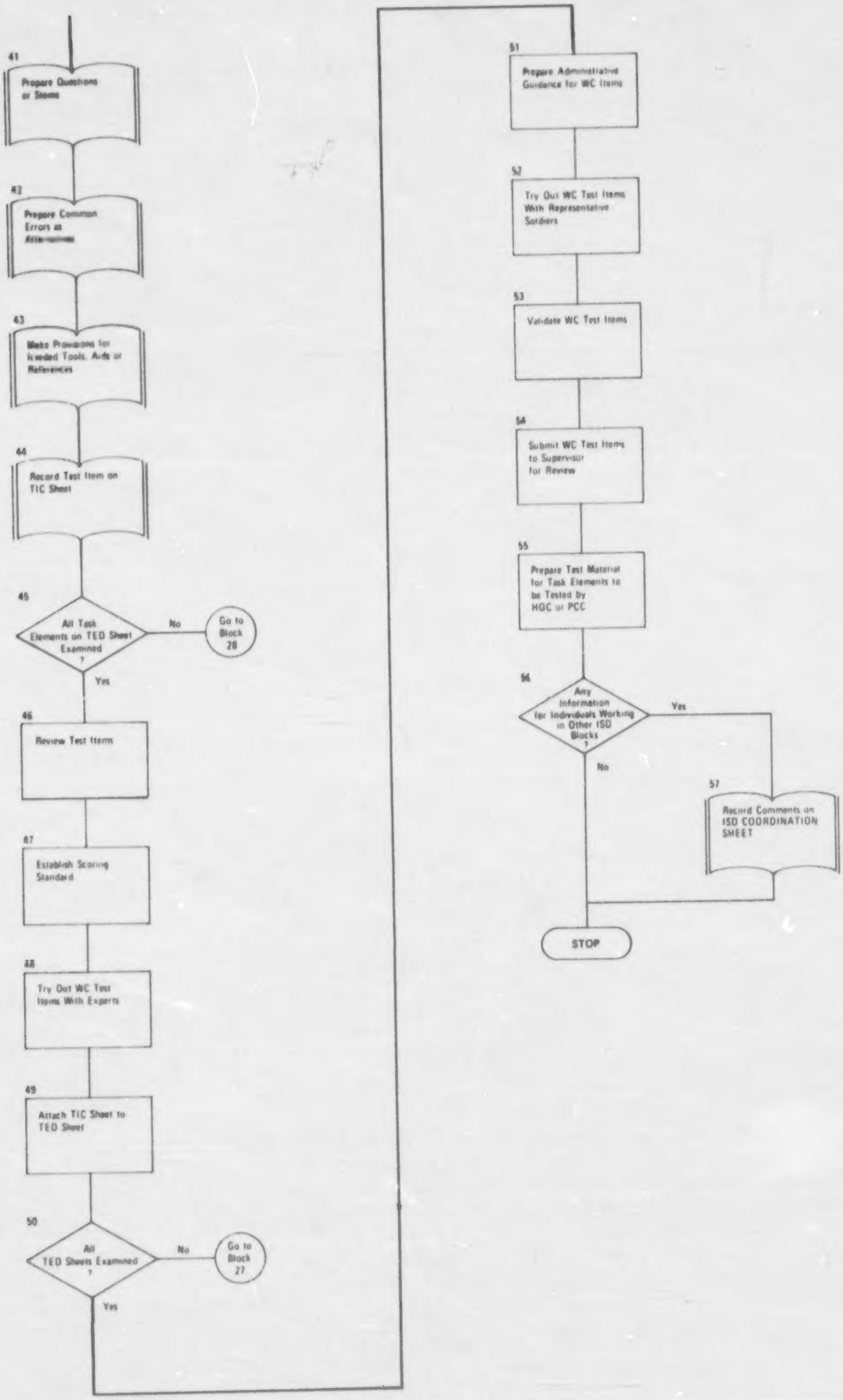
In your research for this step of the Instructional Systems Development process you may have discovered additional information that you think may be useful to people who will be working in steps that follow this one. If so, it is equally important that you pass this information on to appropriate people.

REMEMBER, COMMUNICATION WITHIN THE INSTRUCTIONAL SYSTEMS DEVELOPMENT PROCESS IS CRITICAL FOR EFFECTIVE INSTRUCTIONAL DEVELOPMENT FOR SUCCESSFUL MISSION ACCOMPLISHMENT.

- A copy of the ISD COORDINATION SHEET can be found in the back of this manual. Make sufficient copies to enable you to send one to every individual you wish to communicate with—plus copies for your records.
- Complete the ISD COORDINATION SHEET in duplicate. Send one copy to the individual and attach one copy to the Instruction Settings Selection Package (IRS Sheets).


START
1
Have You Read the Introduction to the Use of Job Aids ?
No
Yes
2
Introduction to the Use of Job Aids
3
Have You Used This Job Aid Before ?
No
Yes
4
Want to See An Overview of the Job Aid ?
Yes
No
5
Overview of Developing Tests Job Aid
6
Is List of Critical Tasks Available ?
No
Yes
7
Guidance for Obtaining/Preparing List of Critical Tasks
8
Is Task Analysis Data Available for Each Task ?
No
Yes
9
Guidance for Obtaining/Preparing Task Analysis Data
10
Are Learning Objectives Available for Each Task ?
No
Yes
11
Guidance for Obtaining/Preparing Learning Objectives
12
Select First/Next Task
13
Examine Task Analysis Data and Learning Objectives to Determine if Task Requires Testing
14
Does Task Require Testing ?
No
Go to Block 12
Yes
15
Obtain Test Element Decision Sheet
16
Complete Section I of TED Sheet
17
Has Task Analysis Data and Learning Objectives Been Examined for Each Task ?
No
Go to Block 12
Yes
18
Have Enough Tasks Been Selected ?
No
Yes
19
Select Additional Tasks
20
Group Tasks (TED Sheets) in Order of Priority for Testing


21
Have Too Many Tasks Been Selected for Testing ?
Yes
No
22
Reconsider Tasks With Low Priority for Testing
23
Select First/Next TED Sheet
24
Select/Record Task Elements to be Included in Testing (Col. 1, Section II, TED Sheet)
25
Determine/Record Component to Which Task Element Should be Assigned (Col. 2, Section II, TED Sheet)
26
Have All TED Sheets Been Examined ?
No
Go to Block 23
Yes
27
Select First/Next TED Sheet
28
Examine First/Next Task Element
29
Is Element to be Tested as a HOC or PCC ?
Yes
No
30
Temporarily Disregard This Task Element
Go to Block 45
31
Determine/Record if WC Element Will be Tested by Written Performance or Performance Based Test Item (Col. 2, Section II, TED Sheet)
32
Obtain Test Item Construction Sheet (TIC)
33
Complete Section I of TIC Sheet
34
Element to be Tested by Written Performance Test Item ?
No
Yes
35
Item to be Tested by Performance Based Test Item ?
No
Go to Block 31
Yes
36
Determine Reason(s) That Soldiers Frequently Cannot Perform Task Element
37
Develop Item Which Will Thoroughly Examine the Reasons for Failure to Perform Task Element
38
Record Test Item on TIC Sheet
Go to Block 45
39
Develop Test Situation in Which Examinee is to Prepare Product
40
Determine if Job Stimulus Conditions Must be Reflected in Test Item


41
Prepare Questions or Stems
42
Prepare Common Errors as Alternatives
43
Make Provisions for Needed Tools, Aids or References
44
Record Test Item on TIC Sheet
45
All Task Elements on TED Sheet Examined ?
No
Go to Block 28
Yes
46
Review Test Items
47
Establish Scoring Standard
48
Try Out WC Test Items With Experts
49
Attach TIC Sheet to TED Sheet
50
All TED Sheets Examined ?
No
Go to Block 27
Yes
51
Prepare Administrative Guidance for WC Items
52
Try Out WC Test Items With Representative Soldiers
53
Validate WC Test Items
54
Submit WC Test Items to Supervisor for Review
55
Prepare Test Material for Task Elements to be Tested by HOC or PCC
56
Any Information for Individuals Working in Other ISD Blocks ?
Yes
No
57
Record Comments on ISD COORDINATION SHEET
STOP

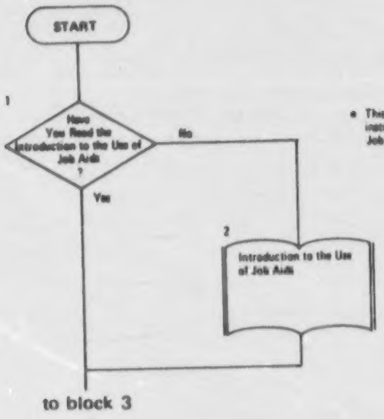
JOB AID FOR
DESCRIBING ENTRY BEHAVIOR

ISD II.3

Manual

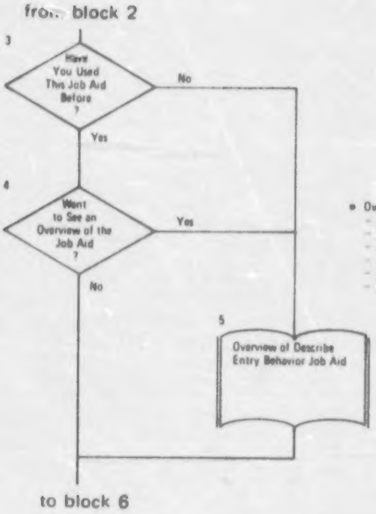
This is the 7th in a series of ISD Job Aids for use in instructional design and development. This volume is to be used as a supplement to the primary document, "Job Aids: Descriptive Authoring Flowcharts ISD II.3 Describe Entry Behavior." The flowchart document will direct you to specific guidance, examples, and references provided in this volume. If you do not have the primary flowchart document, request it from your supervisor.

The wording in this manual should not be construed to discriminate between the sexes. In order to avoid a repetitious use of the terminology, "he/she," the terms, "he," "him," and "his," as well as "men," are intended to include both the masculine and feminine gender. Any exceptions to this usage will be so noted.


START
1
Have You Read the Introduction to the Use of Job Aids ?
No
Yes
2
Introduction to the Use of Job Aids
to block 3

- This introduction provides the user with instruction on the basic structure of the Job Aids and guidance for their use.

- Refer to Introduction.


from block 2
3
Have You Used This Job Aid Before ?
No
Yes
4
Want to See an Overview of the Job Aid ?
Yes
No
5
Overview of Describe Entry Behavior Job Aid
to block 6

- Overview includes
  - Goal
  - Objectives
  - Products
  - Major steps in process
  - Worksheets used
  - Descriptive Flowchart

- For detailed overview, see below.

What is the Describe Entry Behavior Job Aid all about?

- **GOAL**

Your goal in using this job aid is to test the entry behavior of trainees and to utilize this information in the following way:

— to adjust the beginning point of instructional units

— to verify or revise the assumptions made in the learning analysis performed in ISD II.1, Develop Objectives, about entry skills and knowledges of trainees.

- **OBJECTIVES**

1. Given a learning analysis (output of ISD II.1) to identify and record for each task the following information:
   - Initial breakdown of the task into broad subordinate task elements. (Level 1 and 2 Task Elements)
   - Breakdown of the task into the most detailed subordinate task element for which training is required. (BASIC Task Elements)
2. Having identified and recorded all BASIC Task Elements, to validate the BASIC Task Elements for each task to assure that the learning analysis performed in ISD II.1 was neither carried out in too much detail nor too little detail, and to modify the learning analysis as necessary.

- **PRODUCTS**

This job aid will result in

— a completed Learning Analysis Validation Sheet

— a validated learning analysis for each task

- **MAJOR STEPS IN PROCESS**

Step 1. Determine and record the highest level task elements (Level 1) in the learning analysis.

Step 2. Determine and record the second highest level task elements (Level 2) in the learning analysis.

Step 3. Determine and record the lowest level task elements for which training is required (BASIC Task Elements) in the learning analysis.

Step 4. Develop/administer/score BASIC Task Element Test.

Step 5. Determine criteria for MORE or LESS detailed analysis of BASIC Task Elements.

Step 6. On the basis of the criteria recorded and test scores from the BASIC Task Element Test, determine if any BASIC Task Element needs MORE or LESS detailed analysis.

Step 7. With the assistance of the person who did the original learning analysis in ISD II.1, determine if additional analysis is feasible; and if so, perform the additional analysis.

Step 8. Report any changes in the original learning analysis to all persons whose ISD output will be affected.

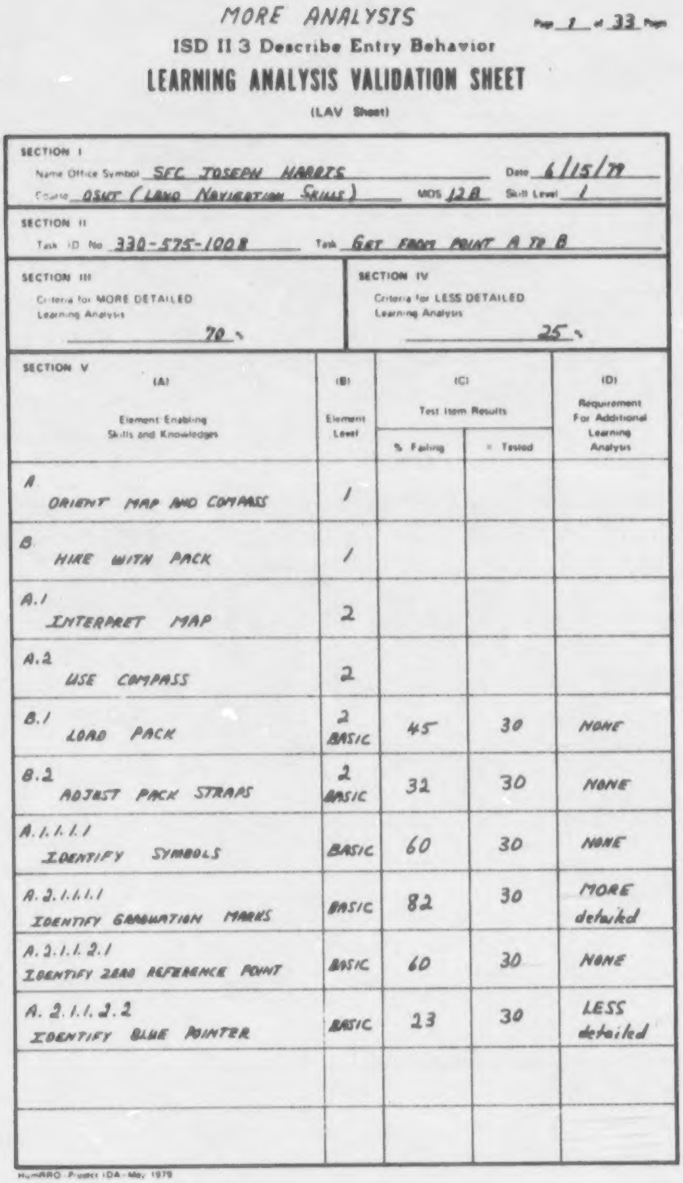
- **WORKSHEETS USED**

— On page G-5 is an example of a completed Learning Analysis Validation Sheet (LAV Sheet).

- **DESCRIPTIVE FLOWCHART**

— The flowchart on pages G-54 thru G-55 shows the steps in using the Describe Entry Behavior Job Aid. The flowchart will be useful in getting a clear picture of the overall process used in this job aid. A more completely described flowchart is provided in Job Aids: Descriptive Authoring Flowcharts, pages G-3 thru G-12.

EXAMPLE:



MORE ANALYSIS

Page 1 of 33 Pages

ISD II 3 Describe Entry Behavior

LEARNING ANALYSIS VALIDATION SHEET

(LAV Sheet)

SECTION I

Name Office Symbol SFC JOSEPH HARRIS Date 6/15/79

Course OSUT (LAND NAVIGATION SKILLS) MOS 12B Skill Level 1

SECTION II

Task ID No 330-575-1008 Task GET FROM POINT A TO B

SECTION III

Criteria for MORE DETAILED Learning Analysis 70 %

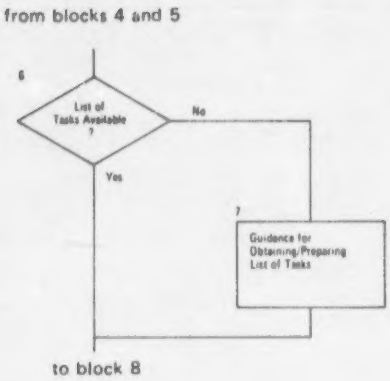
SECTION IV

Criteria for LESS DETAILED Learning Analysis 25 %

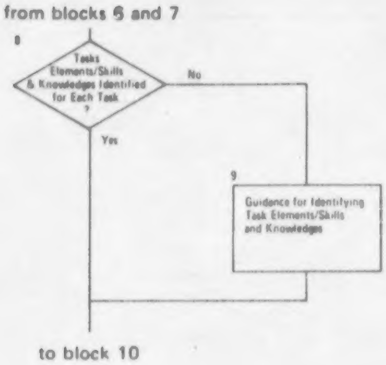
SECTION V

(A) Element Enabling Skills and Knowledges	(B) Element Level	(C) Test Item Results		(D) Requirement For Additional Learning Analysis
		% Failing	# Tested	
A ORIENT MAP AND COMPASS	1			
B HIKE WITH PACK	1			
A.1 INTERPRET MAP	2			
A.2 USE COMPASS	2			
B.1 LOAD PACK	2 BASIC	45	30	NONE
B.2 ADJUST PACK STRAPS	2 BASIC	32	30	NONE
A.1.1.1.1 IDENTIFY SYMBOLS	BASIC	60	30	NONE
A.2.1.1.1.1 IDENTIFY GRADUATION MARKS	BASIC	82	30	MORE detailed
A.2.1.1.2.1 IDENTIFY ZERO REFERENCE POINT	BASIC	60	30	NONE
A.2.1.1.2.2 IDENTIFY BLUE POINTER	BASIC	23	30	LESS detailed

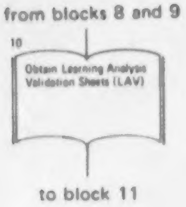
HumRRO Project IDA May 1979


from blocks 4 and 5
6
List of Tasks Available ?
No
Yes
7
Guidance for Obtaining/Preparing List of Tasks
to block 8

- A list of tasks should be available as output from ISD I.2, Conduct Task Analysis
- If a list is not available, request it from the person responsible for performing the task analysis in ISD I.2
- When list has been obtained, return to Descriptive Authoring Flowchart II.3, Describe Entry Behavior, Block 6


from blocks 6 and 7
8
Tasks Elements/Skills & Knowledges Identified for Each Task ?
No
Yes
9
Guidance for Identifying Task Elements/Skills and Knowledges
to block 10

- Task elements/skills and knowledges should be available as output from ISD II.1, Develop Objectives
- If not available, request them from the person responsible for performing the learning analysis
- When task elements/skills & knowledges have been obtained for each task, return to Descriptive Authoring Flowchart, II.3, Describe Entry Behavior, Block 8

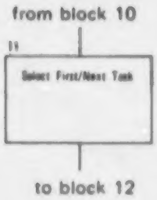


from blocks 8 and 9
10
Obtain Learning Analysis Validation Sheets (LAV)
to block 11

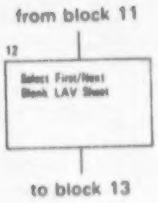
- The LAV Sheets are used for recording
  - task elements which will later be used to identify pre test items for use in self paced instruction
  - the most detailed subordinate task elements for which training is required
  - validation results of assumed entry level skills & knowledges
- For guidance in obtaining LAV Sheets, see below

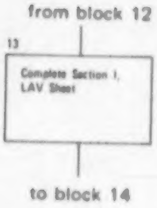
Where can I obtain a Learning Analysis Validation (LAV) Sheet?

- LAV Sheets are available for duplication in the back pocket of this manual.
- To see an example of a completed LAV Sheet, refer to page G-5.


from block 10
11
Select First/Next Task
to block 12

- This block begins the process of recording information needed to validate the learning analyses performed in ISD, II.1, Develop Objectives.

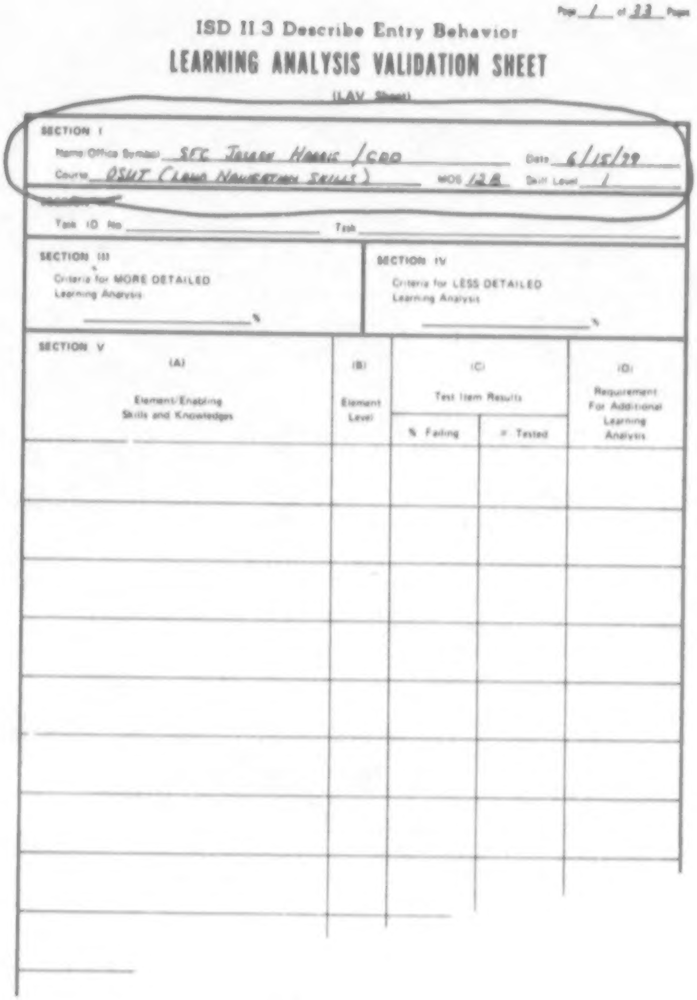

from block 11
12
Select First/Next Blank LAV Sheet
to block 13



- Information required in Section I:
  - Name/Office Symbol
  - Date
  - Course
  - MOS
  - Skill Level
- For example, see below

What does LAV Sheet look like after Section I has been completed?

EXAMPLE:



Page 1 of 33 Pages

ISD II.3 Describe Entry Behavior

LEARNING ANALYSIS VALIDATION SHEET

(LAV Sheet)

SECTION I

Name/Office Symbol SFC Jason Harris /CDD Date 6/15/79

Course OSUT (Land Navigation Skills) MOS 12B Skill Level 1

SECTION II

Task ID No ______ Task ______

SECTION III

Criteria for MORE DETAILED Learning Analysis

______%

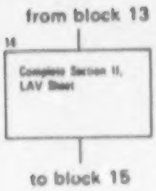
SECTION IV

Criteria for LESS DETAILED Learning Analysis

______%

SECTION V

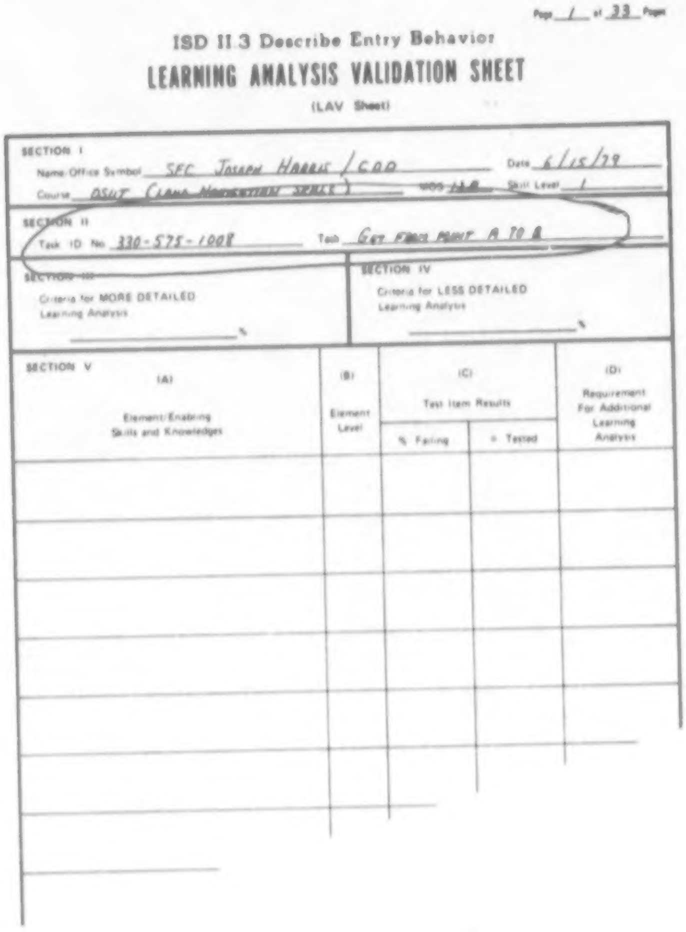
(A) Element/Enabling Skills and Knowledges	(B) Element Level	(C) Test Item Results		(D) Requirement For Additional Learning Analysis
		% Failing	# Tested	



- Information required in Section II:
  - Task ID No.
  - Task
- For example, see below.

What does LAV Sheet look like after Section II has been completed?

EXAMPLE:



Page 1 of 33 Pages

ISD II.3 Describe Entry Behavior

LEARNING ANALYSIS VALIDATION SHEET

(LAV Sheet)

SECTION I

Name/Office Symbol SFC Joseph Harris / COD Date 6/15/79

Course OSUT (Land Navigation Skills) MOS 11B Skill Level 1

SECTION II

Task ID No. 330-575-1008 Task Get From Point A to B

SECTION III

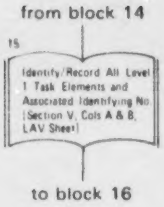
Criteria for MORE DETAILED Learning Analysis ______%

SECTION IV

Criteria for LESS DETAILED Learning Analysis ______%

SECTION V

(A) Element/Enabling Skills and Knowledges	(B) Element Level	(C) Test Item Results		(D) Requirement For Additional Learning Analysis
		% Failing	# Tested	


from block 14
15
Identify/Record All Level 1 Task Elements and Associated Identifying No. (Section V, Cols A & B, LAV Sheet)
to block 16

- Level 1 Task Elements are the first level of task breakdown into subordinate task elements
- Level 1 Task Elements will be used to identify test items for use in self paced instruction
- For further guidance see below

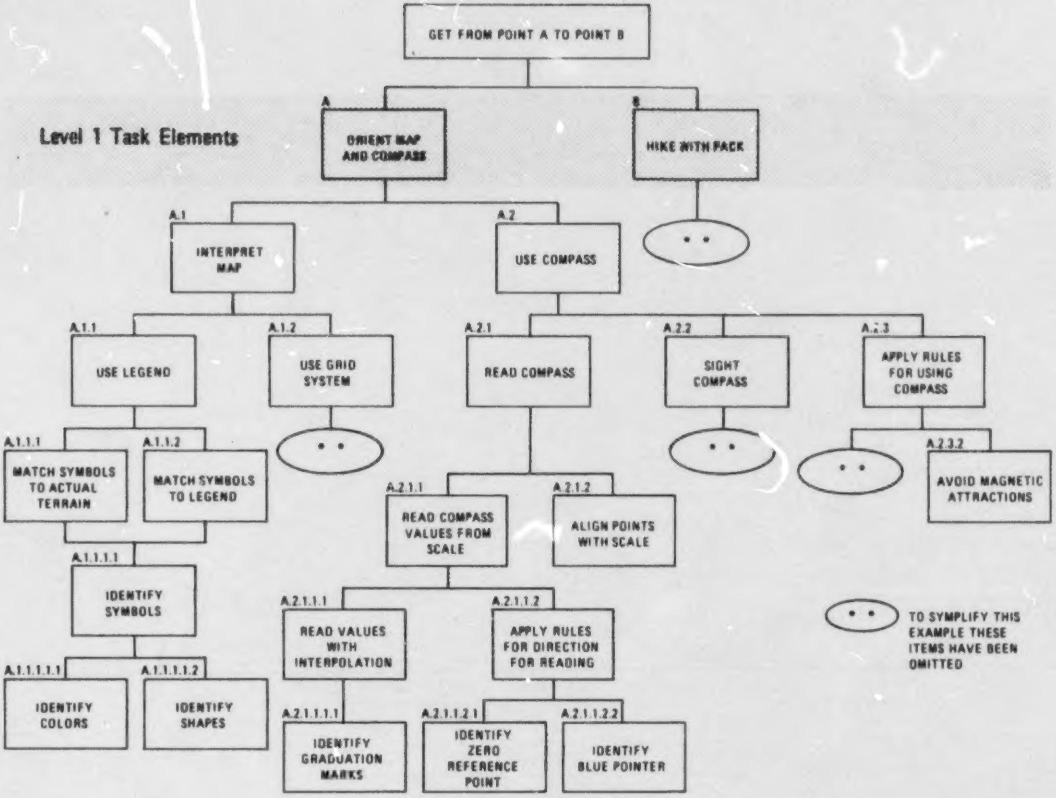
Why should I identify Level 1 Task Elements?

In ISD III.2 a decision will be made as to how each task will be trained, i.e., self-paced, group-paced, etc. If it is decided that the task should be trained in a self-paced mode, it will be necessary to identify those task elements and their associated learning objectives for which the student does not require training. This identification will be accomplished through the administration of a pretest which consists of test items for upper level task elements. In this block you will identify Level 1 Task Elements.

How do I identify Level 1 Task Elements?

In the learning analysis done in ISD II.1, Develop Objectives, the task statement and task elements should have been arranged in a modified pyramid form. At the top of the pyramid was the task statement, and below that were the task elements and enabling skills and knowledges. An example of a modified learning pyramid is given on the next page.

EXAMPLE:

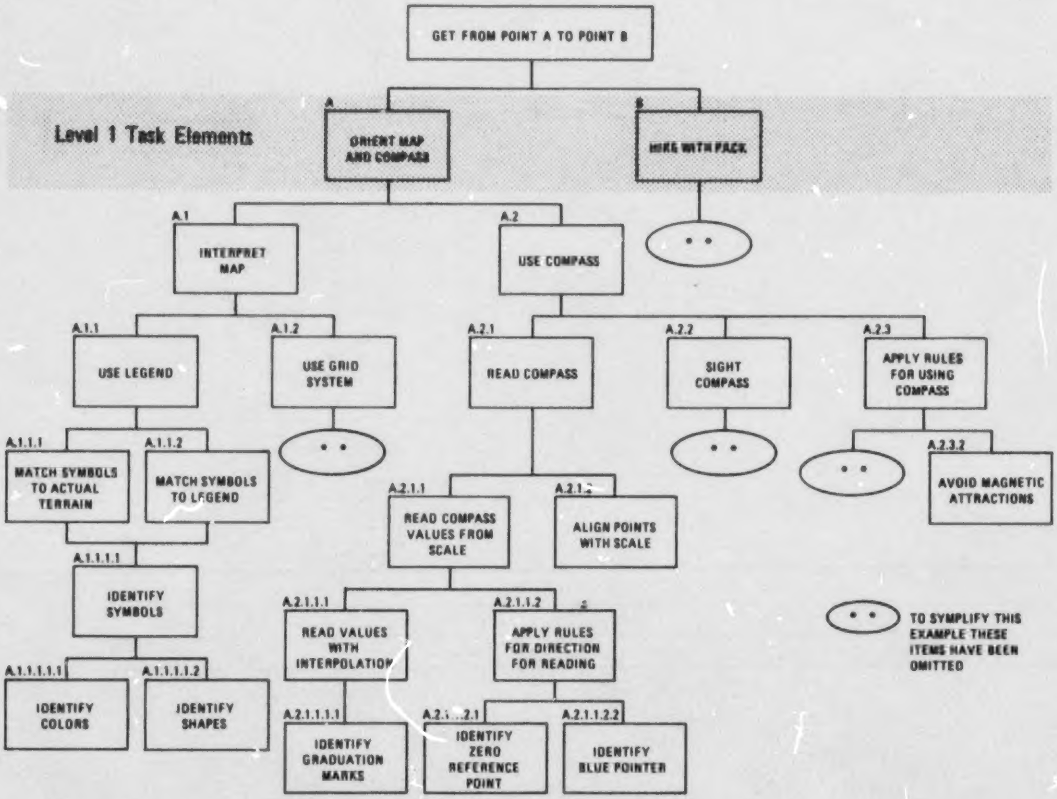

GET FROM POINT A TO POINT B
Level 1 Task Elements
A
ORIENT MAP AND COMPASS
B
HIKE WITH PACK
A.1
INTERPRET MAP
A.2
USE COMPASS
A.1.1
USE LEGEND
A.1.2
USE GRID SYSTEM
A.2.1
READ COMPASS
A.2.2
SIGHT COMPASS
A.2.3
APPLY RULES FOR USING COMPASS
A.1.1.1
MATCH SYMBOLS TO ACTUAL TERRAIN
A.1.1.2
MATCH SYMBOLS TO LEGEND
A.2.3.2
AVOID MAGNETIC ATTRACTIONS
A.2.1.1
READ COMPASS VALUES FROM SCALE
A.2.1.2
ALIGN POINTS WITH SCALE
A.1.1.1.1
IDENTIFY SYMBOLS
A.2.1.1.1
READ VALUES WITH INTERPOLATION
A.2.1.1.2
APPLY RULES FOR DIRECTION FOR READING
TO SYMPLIFY THIS EXAMPLE THESE ITEMS HAVE BEEN OMITTED
A.1.1.1.1.1
IDENTIFY COLORS
A.1.1.1.1.2
IDENTIFY SHAPES
A.2.1.1.1.1
IDENTIFY GRADUATION MARKS
A.2.1.1.2.1
IDENTIFY ZERO REFERENCE POINT
A.2.1.1.2.2
IDENTIFY BLUE POINTER

In this example, "Get from point A to B" is the task statement. Just below the task statement are the Level 1 Task Elements: "Orient map and compass" and "Hike with pack". These are the first level skills or knowledges a person must possess before he can perform the task statement.

If you have a learning pyramid available to you, you can identify the Level 1 Task Elements in your learning analysis by noting their position in the pyramid. They are directly below the task statement. If you have no learning pyramid, you should have some means of ranking the task elements and their associated skills and knowledge.

If you used the HumRRO Job Aid for ISD II.1, Develop Objectives, you will have a letter or a letter/number combination to identify each task element in the pyramid. An example of the identification system is given below.

EXAMPLE:


GET FROM POINT A TO POINT B
Level 1 Task Elements
A
ORIENT MAP AND COMPASS
B
HIKE WITH PACK
A.1
INTERPRET MAP
A.2
USE COMPASS
A.1.1
USE LEGEND
A.1.2
USE GRID SYSTEM
A.2.1
READ COMPASS
A.2.2
SIGHT COMPASS
A.2.3
APPLY RULES FOR USING COMPASS
A.1.1.1
MATCH SYMBOLS TO ACTUAL TERRAIN
A.1.1.2
MATCH SYMBOLS TO LEGEND
A.2.3.2
AVOID MAGNETIC ATTRACTIONS
A.2.1.1
READ COMPASS VALUES FROM SCALE
A.2.1.2
ALIGN POINTS WITH SCALE
A.1.1.1.1
IDENTIFY SYMBOLS
A.2.1.1.1
READ VALUES WITH INTERPOLATION
A.2.1.1.2
APPLY RULES FOR DIRECTION FOR READING
TO SYMPLIFY THIS EXAMPLE THESE ITEMS HAVE BEEN OMITTED
A.1.1.1.1.1
IDENTIFY COLORS
A.1.1.1.1.2
IDENTIFY SHAPES
A.2.1.1.1.1
IDENTIFY GRADUATION MARKS
A.2.1.1.2.1
IDENTIFY ZERO REFERENCE POINT
A.2.1.1.2.2
IDENTIFY BLUE POINTER

In this example, Level 1 Task Elements can be easily distinguished becuase they are identified with a letter: "Orient map and compass" is A, and "Hike with pack" is B. If there were more Level 1 Task Elements, they would have the letters C, D, E, etc.

It is unimportant if you have used another system of identification, so long as you can determine and record the task element levels. If you did not use a letter/number system to identify the various levels of elements in your learning pyramid, you can adopt the system illustrated in the example.

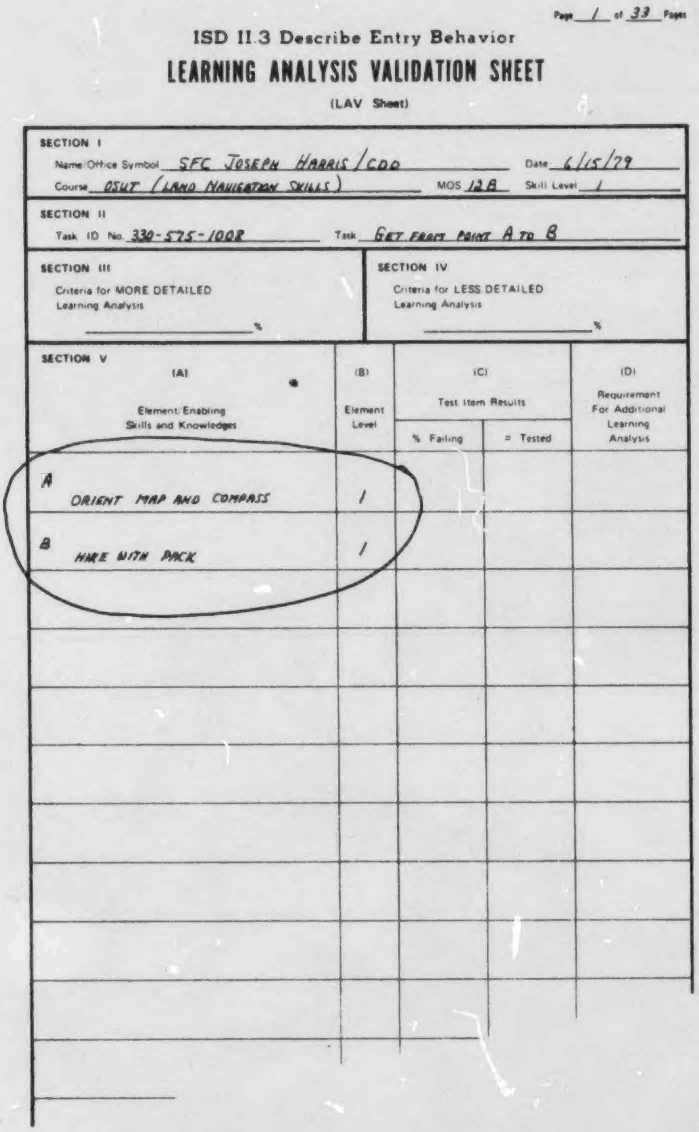
If there are no Level 1 Task Elements in the learning analysis, coordinate with the person who performed the learning analysis in ISD II.1, or the person who developed the critical task list in ISD I.3. A properly defined task should be capable of being broken down into at least Level 1 Task Elements.

How do I record the Level 1 Task Elements on the LAV Sheet?

When you have located all the Level 1 Task Elements in your learning analysis, record the element and its identification number or letter/number on the LAV Sheet, Column A. In Column B, record a 1 after all the first level elements.

What does the LAV Sheet look like after the Level 1 Task Elements are recorded?

EXAMPLE:



Page 1 of 33 Pages

ISD II.3 Describe Entry Behavior

LEARNING ANALYSIS VALIDATION SHEET

(LAV Sheet)

SECTION I

Name/Office Symbol SFC JOSEPH HARRIS / CDD Date 6/15/79

Course OSUT (LAND NAVIGATION SKILLS) MOS 12B Skill Level 1

SECTION II

Task ID No. 330-575-1008 Task GET FROM POINT A TO B

SECTION III

Criteria for MORE DETAILED Learning Analysis

________ %

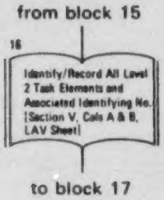
SECTION IV

Criteria for LESS DETAILED Learning Analysis

________ %

SECTION V

(A) Element/Enabling Skills and Knowledges	(B) Element Level	(C) Test Item Results		(D) Requirement For Additional Learning Analysis
		% Failing	= Tested	
A ORIENT MAP AND COMPASS	1			
B HIKE WITH PACK	1			


from block 15
16
Identify/Record All Level 2 Task Elements and Associated Identifying No. [Section V, Cols A & B, LAV Sheet]
to block 17

- Level 2 Task Elements are the second level of task breakdown into subordinate task elements.
- Level 2 Task Elements will also be used to identify test items for use in self-paced instruction.
- For further guidance, see below.

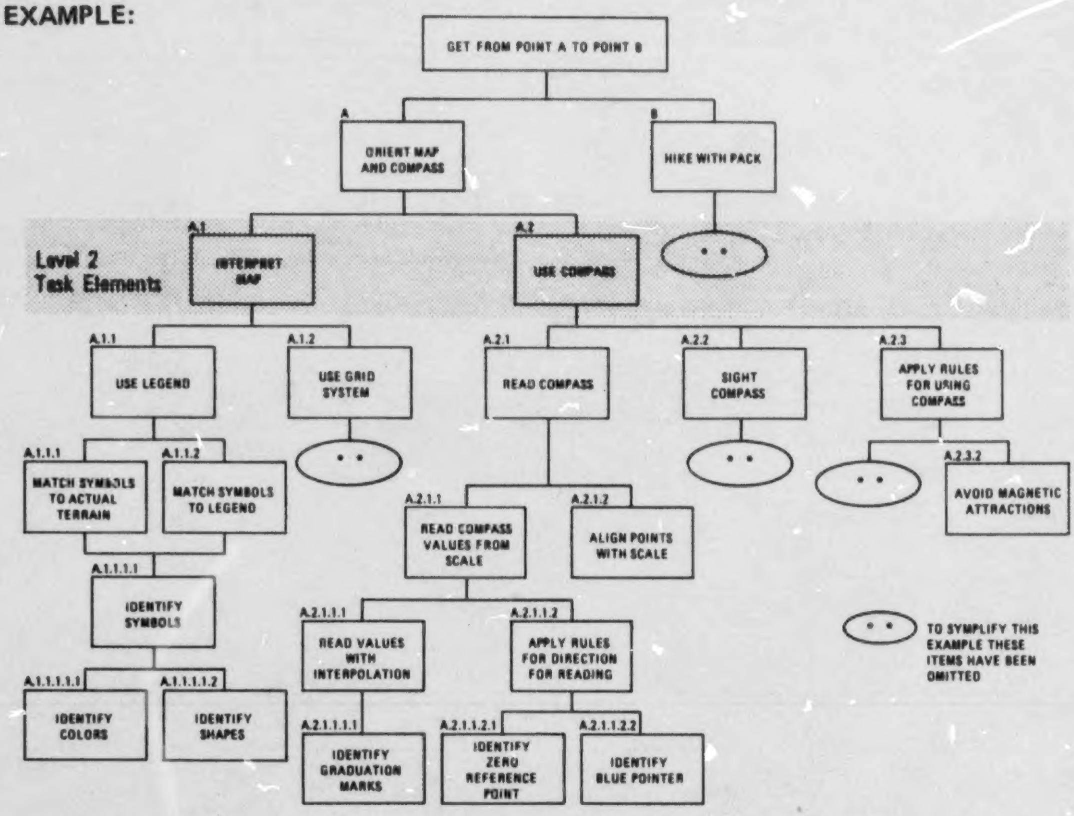
Why should I identify Level 2 Task Elements?

If self-paced instruction is determined to be the best mode for training this task, Level 2 Task Elements will also be included in the pretest. Ideally, it would be desirable to include in the pretest, test items for all task element levels. But because of practical constraints, we recommend that the pretest include test items for only Level 1 and Level 2 Task Elements.

How do I identify Level 2 Task Elements?

The methods for locating Level 2 Task Elements are similar to those explained in the previous block. Level 2 elements can be identified by their position within the learning pyramid and by the letter/number system. (See example on next page.)

EXAMPLE:



GET FROM POINT A TO POINT B
A
ORIENT MAP AND COMPASS
B
HIKE WITH PACK
Level 2 Task Elements
A.1
INTERPRET MAP
A.2
USE COMPASS
A.1.1
USE LEGEND
A.1.2
USE GRID SYSTEM
A.2.1
READ COMPASS
A.2.2
SIGHT COMPASS
A.2.3
APPLY RULES FOR USING COMPASS
A.1.1.1
MATCH SYMBOLS TO ACTUAL TERRAIN
A.1.1.2
MATCH SYMBOLS TO LEGEND
A.2.3.2
AVOID MAGNETIC ATTRACTIONS
A.2.1.1
READ COMPASS VALUES FROM SCALE
A.2.1.2
ALIGN POINTS WITH SCALE
A.1.1.1.1
IDENTIFY SYMBOLS
A.2.1.1.1
READ VALUES WITH INTERPOLATION
A.2.1.1.2
APPLY RULES FOR DIRECTION FOR READING
TO SYMPLIFY THIS EXAMPLE THESE ITEMS HAVE BEEN OMITTED
A.1.1.1.1.1
IDENTIFY COLORS
A.1.1.1.1.2
IDENTIFY SHAPES
A.2.1.1.1.1
IDENTIFY GRADUATION MARKS
A.2.1.1.2.1
IDENTIFY ZERO REFERENCE POINT
A.2.1.1.2.2
IDENTIFY BLUE POINTER

In the example above, the Level 2 Task Elements have been identified by using the letter of the appropriate level 1 element and a number. Thus, "Interpret Map," which is a sub-element of A, "Orient Map and Compass," (Level 1 element) is identified as A.1. The other sub-element, "Use Compass," is identified as A.2. Were there more sub-elements of A, they would be identified as A.3, A.4, A.5, etc. The sub-elements under B, "Hike with Pack," would be identified as B.1, B.2, B.3, etc.

If you did not use a letter/number system to identify the various elements in your learning pyramid you can adopt the system illustrated in the example.

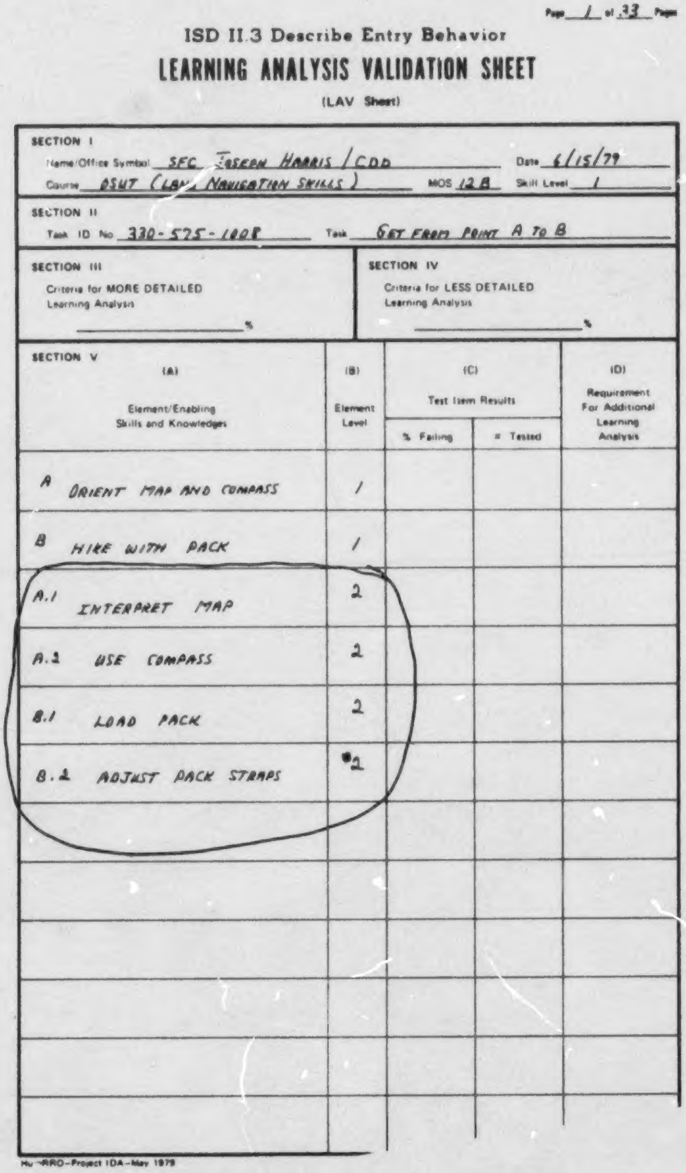
It is possible that your learning analysis will contain no Level 2 Task Elements.

How do I record the Level 2 Task Elements?

- When you have located all the Level 2 Task Elements in your learning analysis, record the element and its identification number or letter/number on the LAV Sheet, Column A. In Column B, record a 2 after all the second level elements.
- If there are no Level 2 Task Elements, record "NO 2" in Column B.

What does the LAV Sheet look like after the Level 2 Task Elements are recorded?

EXAMPLE:



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ISD II.3 Describe Entry Behavior

LEARNING ANALYSIS VALIDATION SHEET

(LAV Sheet)

SECTION I

Name/Office Symbol SFC JOSEPH HARRIS / CDD Date 6/15/79

Course BSUT (LAND NAVIGATION SKILLS) MOS 12 B Skill Level 1

SECTION II

Task ID No 330-575-1008 Task GET FROM POINT A TO B

SECTION III

Criteria for MORE DETAILED Learning Analysis

______ %

SECTION IV

Criteria for LESS DETAILED Learning Analysis

______ %

SECTION V

(A) Element/Enabling Skills and Knowledges	(B) Element Level	(C) Test Item Results		(D) Requirement For Additional Learning Analysis
		% Failing	# Tested	
A ORIENT MAP AND COMPASS	1			
B HIKE WITH PACK	1			
A.1 INTERPRET MAP	2			
A.2 USE COMPASS	2			
B.1 LOAD PACK	2			
B.2 ADJUST PACK STRAPS	2			

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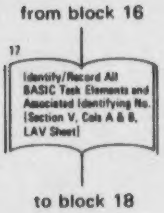

from block 16
17
Identify/Record All BASIC Task Elements and Associated Identifying No. [Section V, Cols A & B, LAV Sheet]
to block 18

- BASIC Task Elements are defined as being the most subordinate task element for which training is required.
- For further guidance, see below.

What is a BASIC Task Element?

- BASIC Task Elements are defined as being the result of the breakdown of a task into its most subordinate elements (or skills and knowledges) for which training is required.

- BASIC Task Elements were identified in ISD II.1, Develop Objectives, as a result of preparing learning analysis pyramids. Learning Objectives should be available for BASIC Task Elements as a product of ISD II.1.

- The following are assumptions concerning BASIC Task Elements:
  - Training is required for all BASIC Task Elements.
  - A majority of entering students tested on the test items derived from BASIC Task Elements will fail them.
  - Any subordinate elements resulting from further breakdown of a BASIC Task Element do not require training.

Why should I identify BASIC Task Elements?

- You will later use BASIC Task Elements for two purposes:
  - To determine if the learning analysis performed in ISD II.1, Develop Objectives, is valid.
  - To identify test items to be included in a pretest for use in group-paced instruction.

- Determine if learning analysis performed in ISD II.1 is valid. In ISD II.1, Develop Objectives, certain assumptions were made about entry level skills and knowledges of the trainee. These assumptions are important because they determined how far the learning analysis was continued. Each task was broken down to the point where it was assumed that most prospective trainees had the prerequisite skills and knowledges for performing the task.

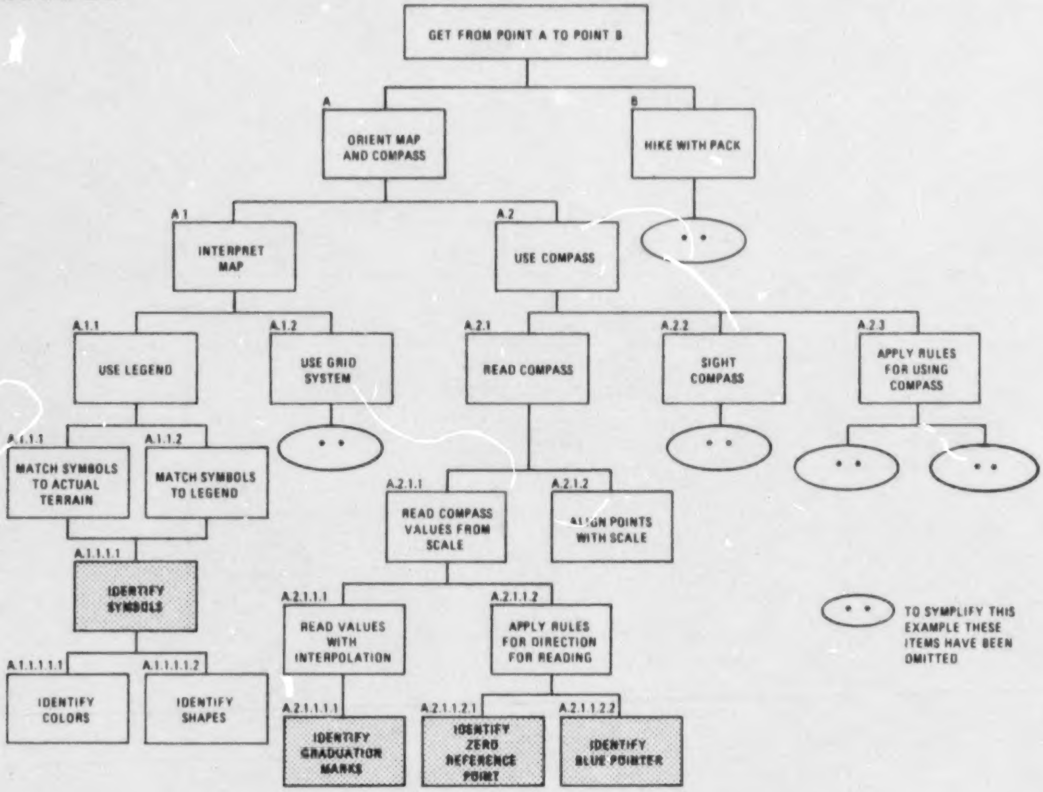
  Since the assumptions about entry level skills and knowledges are the basis for instructional development they must be validated. The validation will assure that the basic entry level of the trainee is correctly reflected in the BASIC Task Elements previously defined in ISD II.1. For example, if you find that all entering trainees can easily perform the activity related to one or more BASIC Task Elements, then the learning analysis for a particular task was carried out too far. If this is the case, the learning analysis for this task will need to be re-examined and possibly less subordinate BASIC Task Elements identified. On the other hand, it is also possible that the learning analysis of a task was not carried out far enough, as only a small percentage of entering trainees can answer or perform test items relating to BASIC Task Elements. In this case the learning analysis may need to be re-examined to determine if more subordinate BASIC Task Elements need to be identified.

- Identify test items to be included in a pretest for use in group-paced instruction. After the learning analysis for each task has been validated, test items for all BASIC Task Elements will be assembled and incorproated into a test. In ISD III.2, Specify Instruction Management Plan and Delivery System, a decision will be made as to what is the most effective delivery system for providing instruction for the task. If it is determined that group-paced instruction is the most effective, the test items for BASIC Task Elements will be used to pretest students to determine if the class as a whole can bypass instruction for one or more of the BASIC Task Elements.

How do I identify and record BASIC Task Elements?

- **Identification of BASIC Task Elements.**
  - BASIC Task Elements were identified in ISD II.1, Develop Objectives. You can determine which task elements are BASIC Task Elements by examining the modified learning analysis pyramids or Learning Objectives Documentation Sheet prepared in ISD II.1.
  - In the example on the next page, the BASIC Task Elements have been shaded to make them more easily identifiable (e.g., Identify Symbols, Identify Graduation Marks, Identify Zero Reference Point, etc.) In the figure, notice particularly that for purposes of illustration we have shown "Identify Symbols" as the BASIC Task Element rather than "Identify Colors" and "Identify Shapes". The reason for doing so is that we made the assumption (in ISD II.1, Develop Objectives) that entering students would already be able to identify colors and shapes; therefore these task elements require no training and are not classified as BASIC Task Elements. On the other hand, it was assumed that entering students would not already know how to identify symbols. This

EXAMPLE:


GET FROM POINT A TO POINT B
A
ORIENT MAP AND COMPASS
B
HIKE WITH PACK
A.1
INTERPRET MAP
A.2
USE COMPASS
A.1.1
USE LEGEND
A.1.2
USE GRID SYSTEM
A.2.1
READ COMPASS
A.2.2
SIGHT COMPASS
A.2.3
APPLY RULES FOR USING COMPASS
A.1.1.1
MATCH SYMBOLS TO ACTUAL TERRAIN
A.1.1.2
MATCH SYMBOLS TO LEGEND
A.2.1.1
READ COMPASS VALUES FROM SCALE
A.2.1.2
ALIGN POINTS WITH SCALE
A.1.1.1.1
IDENTIFY SYMBOLS
A.2.1.1.1
READ VALUES WITH INTERPOLATION
A.2.1.1.2
APPLY RULES FOR DIRECTION FOR READING
A.1.1.1.1.1
IDENTIFY COLORS
A.1.1.1.1.2
IDENTIFY SHAPES
A.2.1.1.1.1
IDENTIFY GRADUATION MARKS
A.2.1.1.2.1
IDENTIFY ZERO REFERENCE POINT
A.2.1.1.2.2
IDENTIFY BLUE POINTER
• •
TO SYMPLIFY THIS EXAMPLE THESE ITEMS HAVE BEEN OMITTED

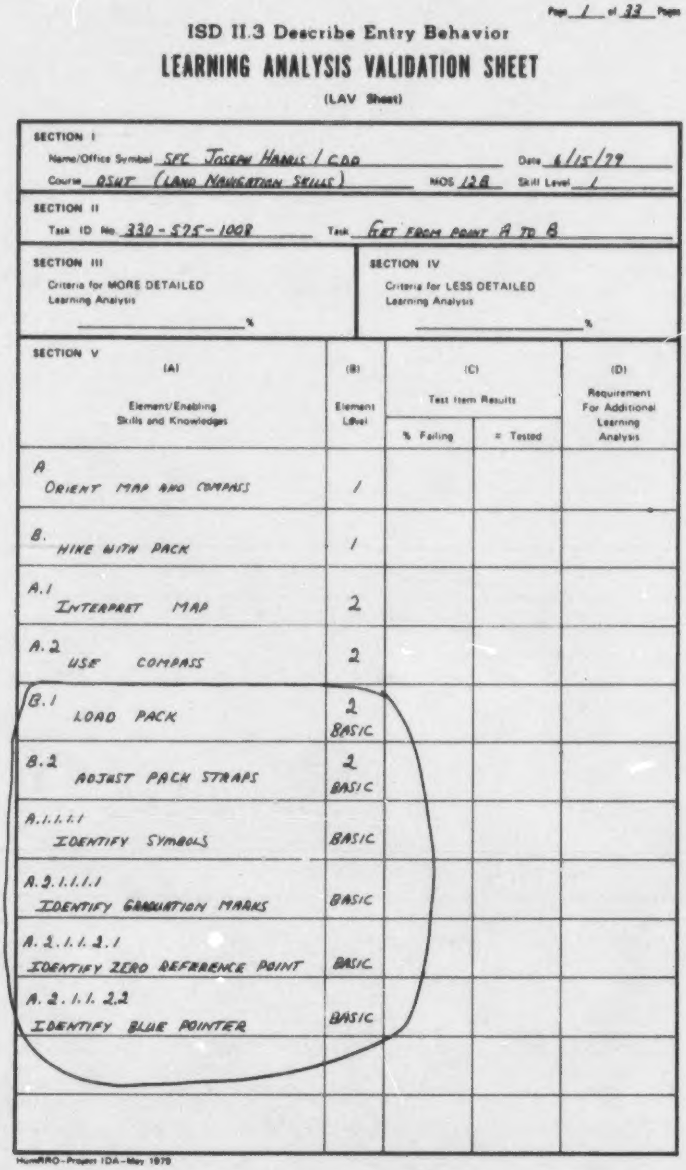
means that the block "Identify Symbols" is the most detailed task element in this branch of the pyramid for which training is required; thus it is classified as a BASIC Task Element.

- A Learning Objective would have been prepared for the task element "Identify Symbols." Learning Objectives for the elements "Identify Colors" and "Identify Shapes" would not have been prepared since students will not receive training for these task elements.
- Examine each branch of the learning analysis pyramid to be certain that you have identified all BASIC Task Elements associated with the task.
- After you have identified all BASIC Task Elements for a task, check to see if there is a Learning Objective for each of these elements. If not, chances are good that you have incorrectly identified one or more BASIC Task Elements. Remember, it was assumed that training for BASIC Task Elements is required and therefore Learning Objectives should have been prepared.

- **Recording Basic Task Elements in Section V of the LAV Sheet**
  - Record each BASIC Task Element and the associated identifying number in Col. A.
  - Record "BASIC", in Col. B., after each BASIC Task Element.
  - In isolated cases a BASIC Task Element may be classified as a Level 2 (or even Level 1) Task Element. In such cases record both the Level number and "BASIC."

What does the LAV Sheet look like after I have recorded the BASIC Task Elements?

EXAMPLE:



Page 1 of 33 Pages

ISD II.3 Describe Entry Behavior

LEARNING ANALYSIS VALIDATION SHEET

(LAV Sheet)

SECTION I

Name/Office Symbol SFC JOSEPH HARRIS / CDD Date 6/15/79

Course OSUT (LAND NAVIGATION SKILLS) MOS 12B Skill Level 1

SECTION II

Task ID No. 330-575-1008 Task GET FROM POINT A TO B

SECTION III

Criteria for MORE DETAILED Learning Analysis

_______________ %

SECTION IV

Criteria for LESS DETAILED Learning Analysis

_______________ %

SECTION V

(A) Element/Enabling Skills and Knowledges	(B) Element Level	(C) Test Item Results		(D) Requirement For Additional Learning Analysis
		% Failing	# Tested	
A ORIENT MAP AND COMPASS	1			
B. HIKE WITH PACK	1			
A.1 INTERPRET MAP	2			
A.2 USE COMPASS	2			
B.1 LOAD PACK	2 BASIC			
B.2 ADJUST PACK STRAPS	2 BASIC			
A.1.1.1.1 IDENTIFY SYMBOLS	BASIC			
A.2.1.1.1.1 IDENTIFY GRADUATION MARKS	BASIC			
A.2.1.1.2.1 IDENTIFY ZERO REFRRENCE POINT	BASIC			
A.2.1.1.2.2 IDENTIFY BLUE POINTER	BASIC			

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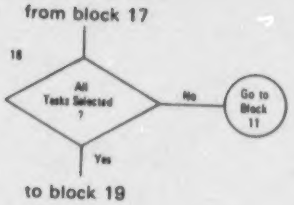
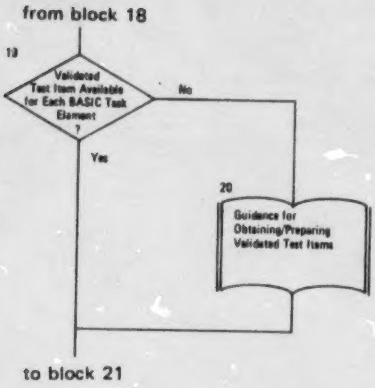
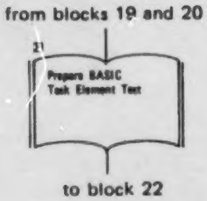

from block 17
18
All
Tasks Selected
?
No
Go to
Block
11
Yes
to block 19


from block 18
19
Validated Test Item Available for Each BASIC Task Element ?
No
Yes
20
Guidance for Obtaining/Preparing Validated Test Items
to block 21

- Validated task items should be available as output from ISD II.2, Develop Tests.
- If they are not available, request them from the person responsible for developing test items.
- When validated test items have been obtained, return to Descriptive Authoring Flowchart, II.3, Block 19.



- The BASIC Task Element Test is comprised of test items derived for all BASIC Task Elements. The test may be a written test, a performance test, or a combination of the two.
- For further information, see below.

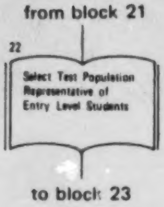
How do I prepare the BASIC Task Element Test?

The BASIC Task Element Test should include all the test items for BASIC Task Elements. It may be a written test, a performance test, or a combination of the two. It will later be used to determine if the BASIC Task Elements have been correctly identified, i.e., that the learning analysis was carried out correctly.

Test instructions should be written out, and the following information should be included:

Purpose of the test.
Testing conditions to be used.
Scoring procedures to be used.
Time limits, if any, for test administration,
Etc.

For more information, see Job Aid for ISD II.2, Develop Tests, and R.W. Swezey, Guidebook for Developing Criterion-Referenced Tests, U.S. Army: Research Institute for the Behavioral and Social Sciences, August 1975.


from block 21
22
Select Test Population Representative of Entry Level Students
to block 23

• For further information, see below.

Why do I select test population representative of entry level students?

Since you are testing entry behavior, you must be certain that your sample population is representative of this group. The sample should not include any people who have already received training in the task(s) being tested. Try to assemble a cross-section of people who will reflect the diversity of skills and knowledges possessed by entering trainees.

For this test, a group of some thirty people should be an adequately large sample population.

from block 22
23
Administer BASIC Task Element Test/Compile Scores
to block 24

How do I administer the BASIC Task Element Test?

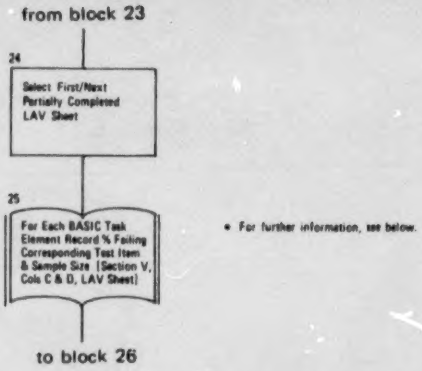
When administering the test, be sure that your instructions are clear, consistent and comprehensive. Also be sure that testing conditions are the same as they will be for the students who will eventually receive training.

More information about test administration is given in R.W. Swezey, Guidebook for Developing Criterion-Referenced Tests, U.S. Army: Research Institute for the Behavioral and Social Sciences, August 1975.

How do I compile the scores for the BASIC Task Element Test?

In compiling the scores for the BASIC Level Task Element Test, determine the following for each test item:

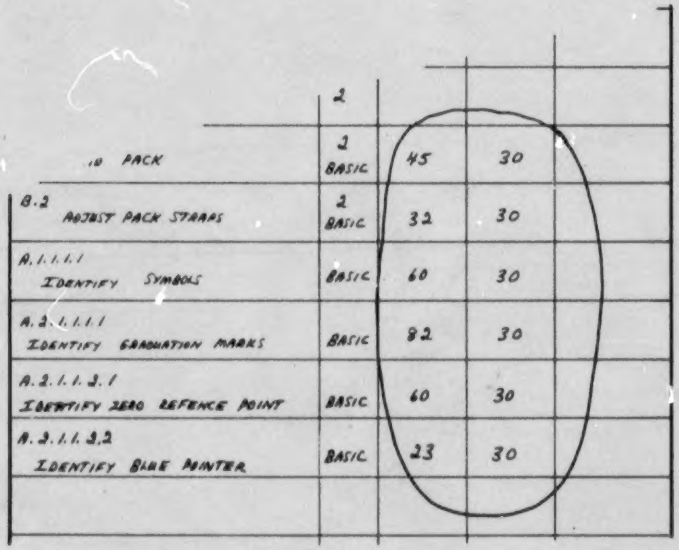
- The total number of individuals to whom the test item was administered.
- The total number of individuals who failed the test item.
- The percentage of individuals who failed the test item. (To figure the percentage, find the number of people who failed and divide it by the total number of individuals to whom the test item was administered.)


from block 23
24
Select First/Next Partially Completed LAV Sheet
25
For Each BASIC Task Element Record % Failing Corresponding Test Item & Sample Size (Section V, Cols C & D, LAV Sheet)
• For further information, see below.
to block 26

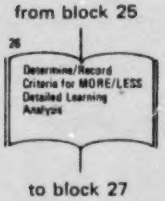
How do I compile the scores for the Basic Task Element Test?

You have already recorded the BASIC Task Elements in Section V. Column A, of the LAV Sheet. Now you must relate each test item to its corresponding BASIC Task Element on the LAV Sheet. After you have done this, record the percent failing each test item and the sample size used to obtain the percentage of failure. By recording the sample size, you will have a permanent record of how you figured the percentage.

What does the LAV Sheet look like after the percent failing and the sample size have been recorded?



	2			
..D PACK	2 BASIC	45	30	
B.2 ADJUST PACK STRAPS	2 BASIC	32	30	
A.1.1.1.1 IDENTIFY SYMBOLS	BASIC	60	30	
A.2.1.1.1.1 IDENTIFY GRADUATION MARKS	BASIC	82	30	
A.2.1.1.2.1 IDENTIFY ZERO REFENCE POINT	BASIC	60	30	
A.2.1.1.2.2 IDENTIFY BLUE POINTER	BASIC	23	30	


from block 25
26
Determine/Record Criteria for MORE/LESS Detailed Learning Analysis
to block 27

- The criteria for MORE/LESS detailed learning analysis will be used in determining if the learning analysis for a task should include more, or less, subordinate task elements.
- For further guidance, see below.

What is meant by "determine criteria for more/less detailed learning analysis"?

In ISD II.1, Develop Objectives, a learning analysis was performed for each task and BASIC Task Elements were identified. (Remember, BASIC Task Elements are defined as the most subordinate element of a task for which training is required.) Identification of the BASIC Task Elements was made on the basis of the subject matter expertise of the individual who performed the learning analysis. One purpose of this job aid is to determine if the learning analysis is correct or if a more or less detailed analysis should be considered. For example consider the following two situations:

Situation 1: All entry-type students who were administered the test item for a BASIC Task Element failed the item (i.e., 100% failed)

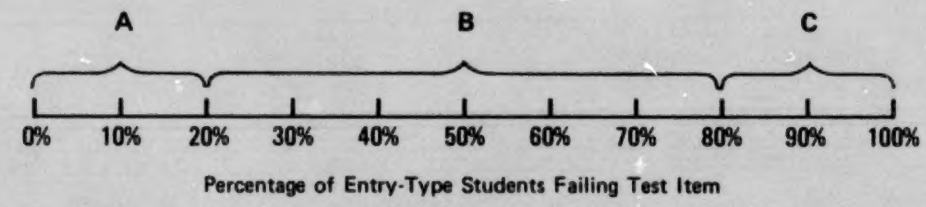
Situation 2: All entry-type students who were administered the test item for a BASIC Task Element passed the item (i.e., 0% failed)

- In Situation 1 you should certainly consider performing a MORE detailed learning analysis. You have no assurance that the task was broken down into sufficient detail. Further breakdown might result in identification of additional subordinate task elements which require training.
- In Situation 2 you should certainly consider performing a LESS detailed learning analysis. It would appear that this task element had been incorrectly identified as a BASIC Task Element inasmuch as it is already known by our representative entry-type students. Therefore, a LESS detailed subordinate task element should perhaps be identified as the BASIC Task Element.

In the two situations above it was easy to decide that MORE detailed learning analysis should be considered for Situation 1 and LESS detailed analysis be considered for Situation 2. However, these are artificial situations. Would you consider performing a MORE detailed learning analysis if 90% of the entry-type students failed the test item? What about 80%? Similarly, would you consider performing a LESS detailed learning analysis if 10% of the entry-type students failed the test item? What about 20%? In this block you will establish the criteria to use in determining if a MORE or LESS detailed learning analysis should be considered.

How do I establish the criterion to use for considering a more detailed learning analysis? A less detailed learning analysis?

- The example below will assist you in understanding and establishing the criteria to be used for consideration of both MORE and LESS detailed learning analysis. Study it carefully before you establish your own criteria.



WHERE:

A = LESS Detailed Learning Analysis. Any BASIC Task Element for which 0-20% of entry-type students fail the corresponding test item will be considered for having LESS detailed learning analysis performed on it.

B = NO Additional Learning Analysis. Any BASIC Task Element for which 21-79% of entry-type students fail the corresponding test item will be considered to require no additional learning analysis to be performed.

C = MORE Detailed Learning Analysis. Any BASIC Task Element for which 80-100% of entry-type students fail the corresponding test item will be considered for having MORE detailed learning analysis performed on it.

- In the example, on the previous page, 20% was established as the criterion to use for considering performing a LESS detailed learning analysis. The criterion for considering performing a MORE detailed learning analysis was established at 80% in the example. In this example, any percentage value falling between 20% and 80% the learning analysis as originally performed is considered correct.

- It is important that you establish your own criteria for determining when you will consider performing a MORE detailed or LESS detailed learning analysis. There are no hard and fast rules for establishing these criteria. However, they should be established individually for each task. Such factors as task importance, consequence of inadequate training on life and equipment, possibility for self-training, training time availability, etc. should be considered.

  - Task importance. The more important the task is to the overall job, the more important it is to be certain that all necessary subordinate task elements are identified and represented in training.
  - Consequences of inadequate training. It is especially important that all necessary subordinate task elements are identified and represented in training when inadequate training of the task might endanger life or equipment.
  - Possibility for self-training. If there is little possibility for a student to learn a necessary subordinate task element through self-training, then it is important that the necessary subordinate element be represented in training.
  - Training time availability. Theoretically, the time available for training should not influence your decision in establishing the criteria for performing MORE or LESS detailed learning analysis. But on a practical basis, if training time is limited, some subordinate task elements may be sacrificed. If training time is available, be certain that all needed subordinate elements are represented in training.

- We suggest the criterion for a MORE detailed learning analysis be no less than 70% and no greater than 90%.

- We also suggest the criterion for a LESS detailed learning analysis be no greater than 30% and no less than 10%.

- After considering all of the above,
  - — for especially important tasks,
  - — for tasks where serious consequences may occur as a result of inadequate training,
  - — for tasks which the student cannot learn through self-training, and
  - — when training time is not overly restricted

  establish the criteria as follows:

  MORE detailed learning analysis criterion: 70%

  LESS detailed learning analysis criterion: 10%

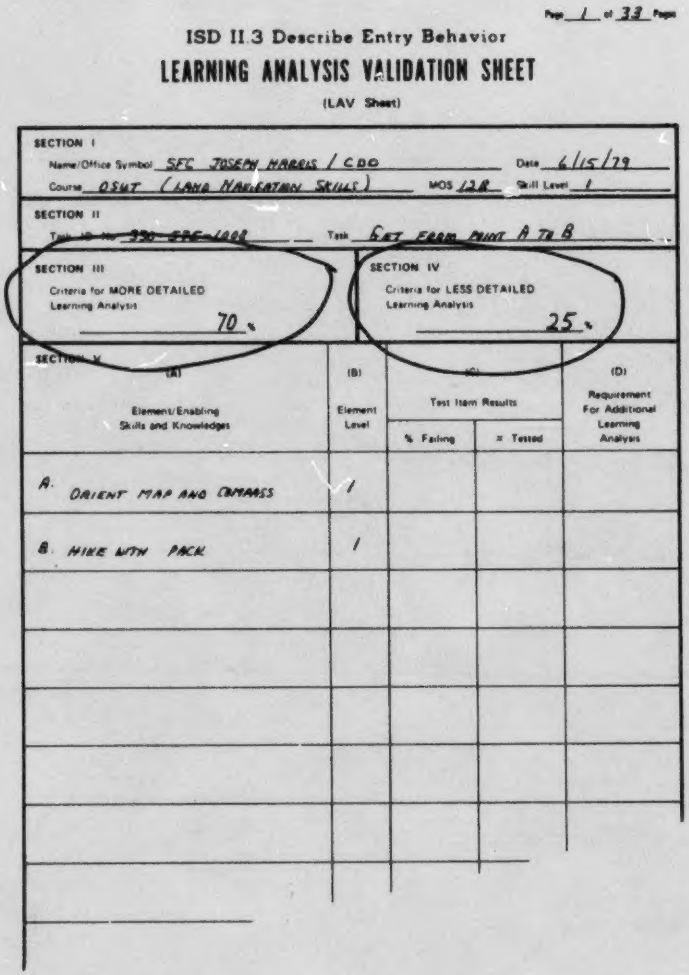
How do I record the criteria for a more/less detailed learning analysis?

- The criterion you will use for considering conducting a MORE detailed learning analysis is recorded in Section III of the LAV Sheet.

- The criterion you will use for considering conducting a LESS detailed learning analysis is recorded in Section IV of the LAV Sheet.

What does the LAV Sheet look like after the criteria for a more/less detailed learning analysis have been recorded?

EXAMPLE:



Page 1 of 33 Pages

ISD II.3 Describe Entry Behavior

LEARNING ANALYSIS VALIDATION SHEET

(LAV Sheet)

SECTION I

Name/Office Symbol SFC JOSEPH HARRIS / CDO Date 6/15/79

Course OSUT (LAND NAVIGATION SKILLS) MOS 12B Skill Level 1

SECTION II

Task ID No. ~~950-EPC-1008~~ Task GET FROM POINT A TO B

SECTION III

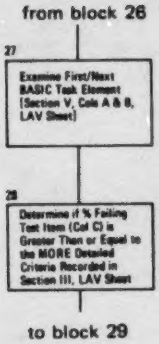
Criteria for MORE DETAILED Learning Analysis 70 %

SECTION IV

Criteria for LESS DETAILED Learning Analysis 25 %

SECTION V

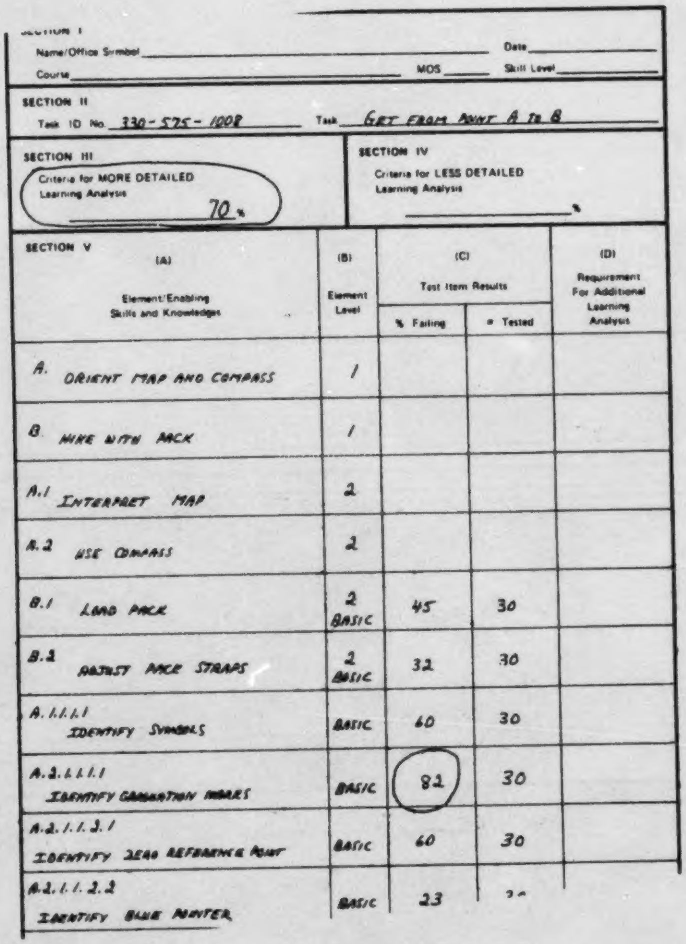
(A) Element/Enabling Skills and Knowledges	(B) Element Level	(C) Test Item Results		(D) Requirement For Additional Learning Analysis
		% Failing	# Tested	
A. ORIENT MAP AND COMPASS	1			
B. HIKE WITH PACK	1			


from block 26
27
Examine First/Next BASIC Task Element (Section V, Cols A & B, LAV Sheet)
28
Determine if % Failing Test Item (Col C) is Greater Than or Equal to the MORE Detailed Criteria Recorded in Section III, LAV Sheet
to block 29

- For example, see below.

How does LAV Sheet look if the percentage failing is greater than or equal to the "MORE detailed" criteria?

EXAMPLE:



ECTION I
Name/Office Symbol ______ Date ______
Course ______ MOS ______ Skill Level ______

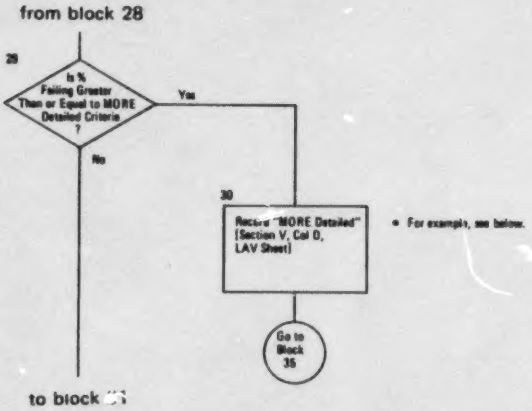
SECTION II
Task ID No. 330-575-1008 Task GET FROM POINT A TO B

SECTION III
Criteria for MORE DETAILED Learning Analysis 70 %

SECTION IV
Criteria for LESS DETAILED Learning Analysis ______ %

SECTION V

(A) Element/Enabling Skills and Knowledges	(B) Element Level	(C) Test Item Results		(D) Requirement For Additional Learning Analysis
		% Failing	# Tested	
A. ORIENT MAP AND COMPASS	1			
B. HIKE WITH PACK	1			
A.1 INTERPRET MAP	2			
A.2 USE COMPASS	2			
B.1 LOAD PACK	2 BASIC	45	30	
B.2 ADJUST PACK STRAPS	2 BASIC	32	30	
A.1.1.1.1 IDENTIFY SYMBOLS	BASIC	60	30	
A.2.1.1.1 IDENTIFY GRADUATION MARKS	BASIC	82	30	
A.2.1.1.2.1 IDENTIFY ZERO REFERENCE POINT	BASIC	60	30	
A.2.1.1.2.2 IDENTIFY BLUE POINTER	BASIC	23	3	


from block 28
29
Is % Failing Greater Than or Equal to MORE Detailed Criteria ?
Yes
No
30
Record "MORE Detailed" [Section V, Col D, LAV Sheet]
Go to Block 35
to block

• For example, see below.

What does LAV Sheet look like when "MORE detailed" is recorded?

EXAMPLE:

_______________%

SECTION V

(A) Element/Enabling Skills and Knowledges	(B) Element Level	(C) Test Item Results		(D) Requirement For Additional Learning Analysis
		% Failing	# Tested	
A.1.1.1.1 IDENTIFY SYMBOLS	BASIC	60	30	
A.2.1.1.1.1 IDENTIFY GRADUATION MARKS	BASIC	82	30	MORE detailed
A.2.1.1.2.1 IDENTIFY ZERO REFERENCE POINT	BASIC	60	30	
A.2.1.1.2.2 IDENTIFY BLUE POINTER	BASIC	23	30	

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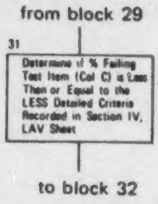

from block 29
31
Determine if % Failing Test Item (Col C) is Less Than or Equal to the LESS Detailed Criteria Recorded in Section IV, LAV Sheet
to block 32

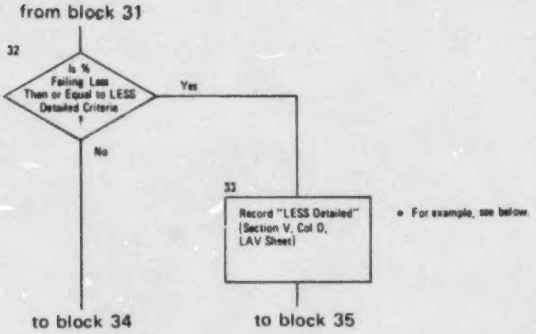
- For example, see below

What does LAV Sheet look like if the percentage failing is less than or equal to the "LESS detailed" criteria?

EXAMPLE:

SECTION III Criteria for MORE DETAILED Learning Analysis __________ %	SECTION IV Criteria for LESS DETAILED Learning Analysis 25 %

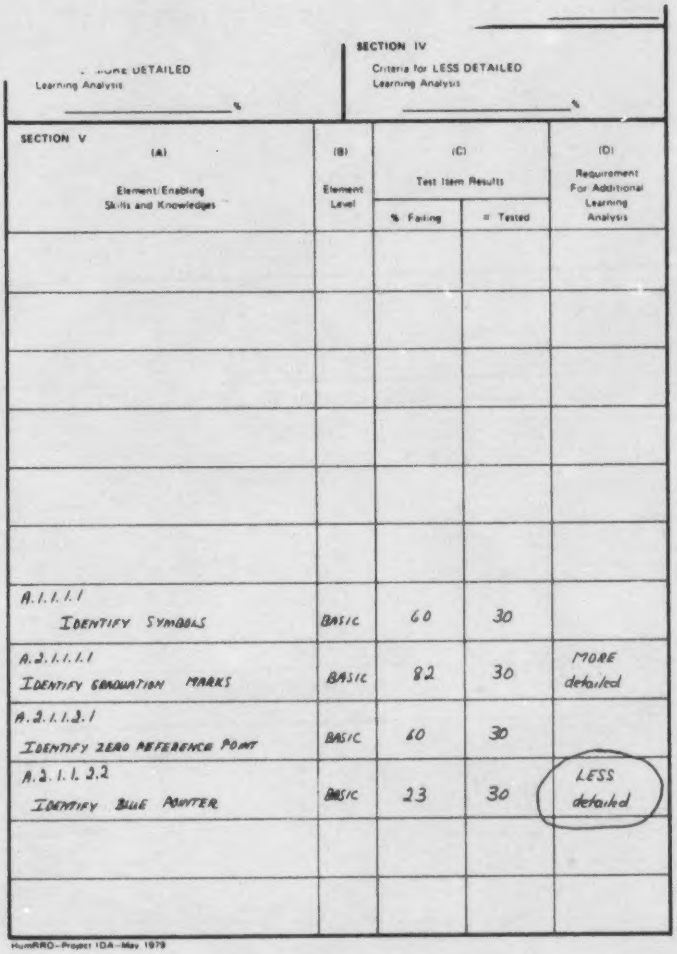
SECTION V (A) Element Enabling Skills and Knowledges	(B) Element Level	(C) Test Item Results		(D) Requirement For Additional Learning Analysis
		% Failing	= Tested	
A. ORIENT MAP AND COMPASS	1			
B. HIKE WITH PACK	1			
A.1 INTERPRET MAP	2			
A.2 USE COMPASS	2			
B.1 LOAD PACK	2 BASIC	45	30	
B.2 ADJUST PACK STRAPS	2 BASIC	32	30	
A.1.1.1.1 IDENTIFY SYMBOLS	BASIC	60	30	
A.2.1.1.1.1 IDENTIFY GRADUATION MARKS	BASIC	82	30	MORE detailed
A.2.1.1.2.1 IDENTIFY ZERO REFERENCE POINT	BASIC	60	30	
A.2.1.1.2.2 IDENTIFY BLUE POINTER	BASIC	23	30	


from block 31
32
Is % Failing Less Than or Equal to LESS Detailed Criteria ?
Yes
No
33
Record "LESS Detailed" (Section V, Col D, LAV Sheet)
to block 34
to block 35

• For example, see below.

What does LAV Sheet look like when "LESS detailed" is recorded?

EXAMPLE:



MORE DETAILED
Learning Analysis
_________________%

SECTION IV
Criteria for LESS DETAILED
Learning Analysis
_________________%

SECTION V

(A) Element/Enabling Skills and Knowledges	(B) Element Level	(C) Test Item Results		(D) Requirement For Additional Learning Analysis
		% Failing	# Tested	
A.1.1.1.1 IDENTIFY SYMBOLS	BASIC	60	30	
A.2.1.1.1.1 IDENTIFY GRADUATION MARKS	BASIC	82	30	MORE detailed
A.2.1.1.2.1 IDENTIFY ZERO REFERENCE POINT	BASIC	60	30	
A.2.1.1.2.2 IDENTIFY BLUE POINTER	BASIC	23	30	LESS detailed

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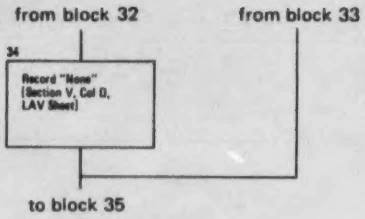
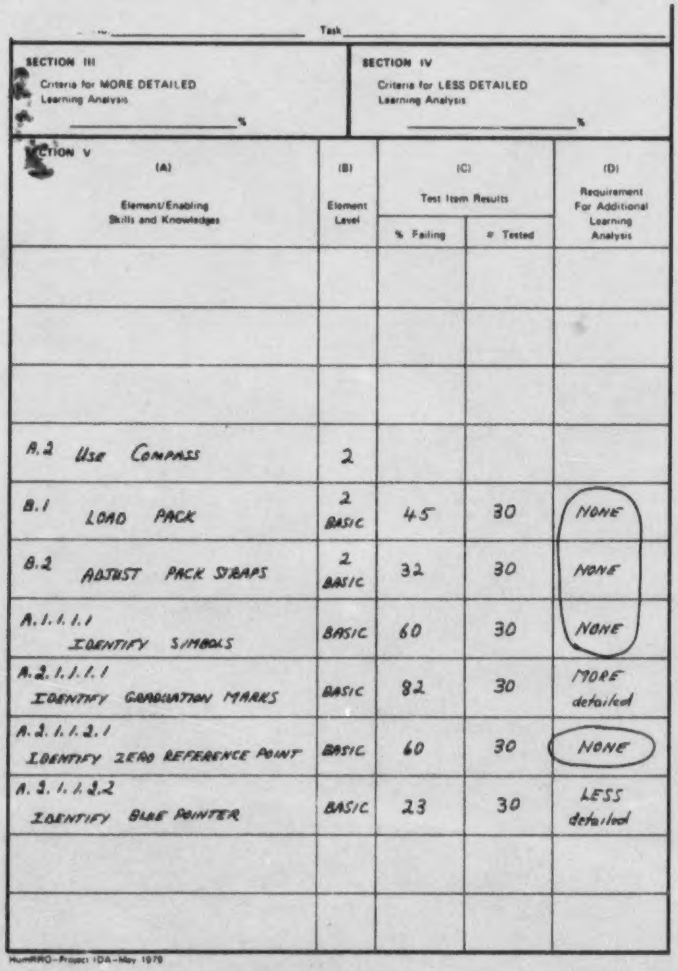

from block 32
from block 33
34
Record "None"
[Section V, Col D,
LAV Sheet]
to block 35

- For example, see below.

What does LAV Sheet look like when "NONE" is recorded?

EXAMPLE:



Task ____________________

SECTION III Criteria for MORE DETAILED Learning Analysis __________%	SECTION IV Criteria for LESS DETAILED Learning Analysis __________%

SECTION V

(A) Element/Enabling Skills and Knowledges	(B) Element Level	(C) Test Item Results		(D) Requirement For Additional Learning Analysis
		% Failing	# Tested	
A.2 Use Compass	2			
B.1 LOAD PACK	2 BASIC	45	30	NONE
B.2 ADJUST PACK STRAPS	2 BASIC	32	30	NONE
A.1.1.1.1 IDENTIFY SYMBOLS	BASIC	60	30	NONE
A.2.1.1.1.1 IDENTIFY GRADUATION MARKS	BASIC	82	30	MORE detailed
A.2.1.1.2.1 IDENTIFY ZERO REFERENCE POINT	BASIC	60	30	NONE
A.2.1.1.2.2 IDENTIFY BLUE POINTER	BASIC	23	30	LESS detailed

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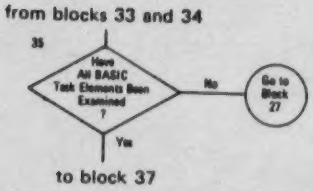
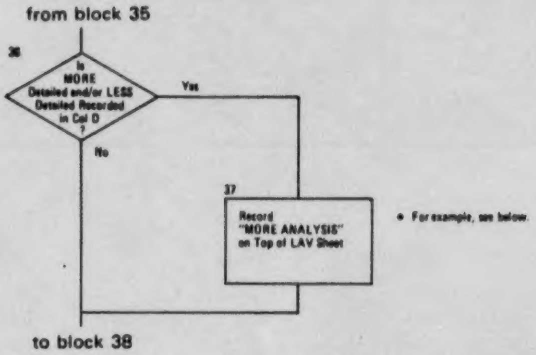

from blocks 33 and 34
35
Have All BASIC Task Elements Been Examined ?
No
Go to Block 27
Yes
to block 37


from block 35
36
Is MORE Detailed and/or LESS Detailed Recorded in Col D ?
Yes
No
37
Record "MORE ANALYSIS" on Top of LAV Sheet
• For example, see below.
to block 38

What does LAV Sheet look like when "MORE ANALYSIS" is recorded?

EXAMPLE:

MORE ANALYSIS

ISD II.3 Describe Entry Behavior

LEARNING ANALYSIS VALIDATION SHEET

(LAV Sheet)

SECTION I

Name/Office Symbol SFC JOSEPH HARRIS / CDD Date 6/15/79

Course DSUT (LAND NAVIGATION SKILLS) MOS 12B Skill Level 1

SECTION II

Task ID No. 330-575-1008 Task GET FROM POINT A TO B

SECTION III

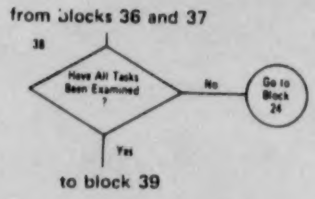
Criteria for MORE DETAILED Learning Analysis 70 %

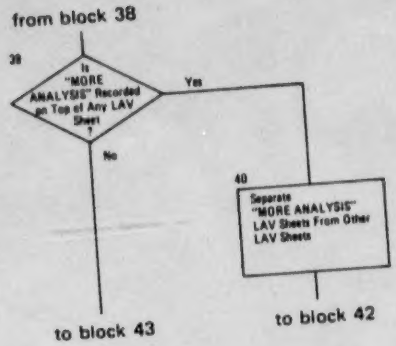
SECTION IV

Criteria for LESS DETAILED Learning Analysis 25 %

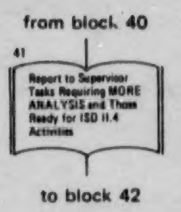
SECTION V

(A) Element/Enabling Skills and Knowledges	(B) Element Level	(C) Test Item Results		(D) Requirement For Additional Learning Analysis
		% Failing	# Tested	
A. ORIENT MAP AND COMPASS	1			
B. HIKE WITH PACK	1			
A.1 INTERPRET MAP	2			
A.2 USE COMPASS	2			
B.1 LOAD PACK	2 BASIC	45	30	NONE
B.2 ADJUST PACK STRAPS	2 BASIC	32	30	NONE
A.1.1.1.1 IDENTIFY SYMBOLS	BASIC	60	30	NONE
A.2.1.1.1.1 IDENTIFY GRADUATION MARKS	BASIC	82	30	MORE detailed
A.2.1.1.2.1 [illegible] FROM DESIGNATE POINT	BASIC	60	30	NONE


from blocks 36 and 37
38
Have All Tasks Been Examined ?
No
Go to Block 24
Yes
to block 39


from block 38
39
Is "MORE ANALYSIS" Recorded on Top of Any LAV Sheet ?
Yes
No
40
Separate "MORE ANALYSIS" LAV Sheets From Other LAV Sheets
to block 43
to block 42

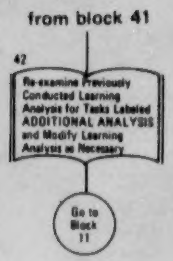
- LAV Sheets are separated into two piles:
  - Those task for which additional learning analysis should be considered (MORE ANALYSIS recorded on top of LAV Sheet)
  - Those tasks for which no further learning analysis is needed.


from block 40
41
Report to Supervisor Tasks Requiring MORE ANALYSIS and Those Ready for ISD II.4 Activities
to block 42

- For further information, see below.

Why report to supervisor the tasks requiring more analysis and those ready for ISD II.4 activities?

Your supervisor will decide how to proceed with the ISD process. The decision to be made is whether the tasks which do not need additional analysis should be sent on to the next ISD block, II.4, Determine Sequence and Structure, while the other tasks receive additional analysis. Or, whether it would be wiser to keep all the tasks together and wait until the additional analysis is completed before sending any tasks on to the next block, II.4.


from block 41
42
Re-examine Previously Conducted Learning Analysis for Tasks Labeled ADDITIONAL ANALYSIS and Modify Learning Analysis as Necessary
Go to Block 11

- For further information, see below.

Who should be involved in the re-examination of the previously conducted learning analysis?

Contact the person who conducted the original learning analysis for any task in which the analysis is in question, (i.e., those tasks for which "ADDITIONAL ANALYSIS" is recorded on the top of the LAV Sheet). This individual may be able to provide valuable information concerning why and how a particular task was broken down into subordinate task elements or skills and knowledges.

Therefore, it is strongly recommended that you work as a team in the re-examination of learning analysis of tasks in question.

What should we look for when re-examining the original learning analysis?

The LAV Sheet for a specific task was labeled "ADDITIONAL ANALYSIS" because the learning analysis validation indicated that the assumptions made in original learning analysis concerning the entry level skills and knowledges of potential trainees were incorrect. The validation may have indicated one or both of the following:

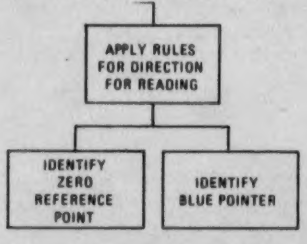
- The task was broken down too far for one or more task elements and therefore "LESS detailed" learning analysis should be considered, (i.e., entry-type students already know the skills and knowledges required for a task element identified as a BASIC Task Element.)

- The task was not broken down far enough for one or more task elements and "MORE detailed" learning analysis should be considered, (i.e., an extremely large percentage of entry-type students failed the test items associated with the BASIC Task Element and there is a real question as to whether BASIC Task Elements have been identified at a sufficiently detailed level.

Therefore, the learning analysis previously performed must be carefully re-examined for each task element in question and a decision made as to whether the learning analysis should be modified.

When re-examining the original learning analysis always examine the modified learning pyramid in its entirety. For all BASIC Task Elements in question ("LESS/MORE detailed" recorded in Column D, LAV Sheet) the re-examination should include the following considerations:

- If LESS detail is indicated you must consider the question:
  - How does the task element presently identified as a BASIC Task Element relate to other BASIC Task Elements in the same branch of the pyramid? Look at the example below. For purposes of illustration assume two situations occurred as a result of the learning analysis validation.


APPLY RULES FOR DIRECTION FOR READING
IDENTIFY ZERO REFERENCE POINT
IDENTIFY BLUE POINTER

Situation 1: Assume that the validation produced the following results:

– Both "Identify Zero Reference Point" and "Identify Blue Pointer" were incorrectly identified as BASIC Task Elements. Validation results indicated that entry-type students already know how to identify zero reference point and the blue pointer. Therefore, "LESS detailed" has been recorded on the LAV Sheet for these task elements.

In this situation you should consider re-classifying the BASIC Task Element at a less detailed level. "Identify Zero Reference Point" and "Identify Blue Pointer" would be dropped as BASIC Task Elements (and not be included in training). "Apply Rules for Direction for Reading" would be classified as the new Basic Task Element.

Situation 2: Assume the validation produced the following results:

– "Identify Zero Reference Point" was correctly identified as a BASIC Task Element.

- **"Identify Blue Pointer" was incorrectly identified as a BASIC Task Element. Validation results indicated that entry-type students already know how to identify the blue pointer. Therefore, "LESS detailed" had been recorded on the LAV Sheet for this task element.**

In this situation, if it were decided by you and the person who performed the original learning analysis that training is indeed not required for "Identify Blue Pointer" then it would be dropped as a BASIC Task Element. However, in this case you would not classify the task element "Apply Rules for Direction for Reading" as a substitute BASIC Task Element. Why? Remember, we earlier defined a BASIC Task Element as being most detailed subordinate elements of a task for which training is required. In this situation "Identify Zero Reference Point" is the most detailed subordinate element of this branch of the learning pyramid. Therefore, in this situation the result of our re-examination might be that we have one less BASIC Task Element.

- If MORE detail is indicated you must consider the question:
  - Can the task element presently identified as a BASIC Task Element be meaningly broken down into further subordinate elements (or skills and knowledges)? For example, "Identify symbols" could be broken down into subordinate elements "Identify Colors" and "Identify Shapes". On the other hand, if "Identify Blue Pointer" was the BASIC Task Element and the validation analysis results indicated "MORE detailed" learning analysis should be considered, you might be hard pressed to meaningfully break this task element down further into more detailed subordinate task elements. It will be necessary for you to use your own judgement (or the judgment of other subject matter experts) in determining if a task element can be broken down into more detailed subordinate BASIC Task Elements. In reaching your decision, ask yourself the following types of questions:
    - If the task element is broken down into more detailed subordinate task elements, will it be possible to prepare meaningful learning objectives for the new BASIC Task Elements?

- Will it be possible to prepare meaningful test items for the new BASIC Task Elements?
- Will there be sufficient time, equipment, facilities, etc. for training of the new BASIC Task Elements?

If the answer to any of the above questions is NO, then you should not break the task down into more detailed subordinate task elements.

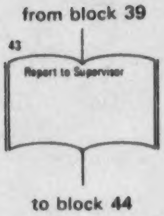
What other things must be considered if a modification is made to the learning analysis for a task?

For any task that you make modifications to the learning analysis, you must consider the effect of the modification on:

- **Learning Objectives**
  - Suppose the LAV Sheet indicates that LESS detail is necessary for a BASIC Task Element, and you have decided to replace this basic element by moving up the pyramid to a higher level task element. As a consequence of this change, the original BASIC Task Element will not be included in the training program, and the learning objective for this task element will no longer be needed. Be certain that these learning objectives are deleted so that they will not inadvertently be included in later training.
  - If the LAV Sheet indicates that MORE detail is necessary for a BASIC Task Element, and you have decided to break down the basic element into still lower skills and knowledges, you will need to prepare learning objectives for all new BASIC Task Elements identified.
  - Check each task element in the learning pyramid that is scheduled to be included in training. Make certain that you have a learning objective for each of these task elements, and for only these task elements.
  - **Be certain that any changes in the learning analysis are also reflected in the "package" (output) resulting from ISD II.1, Develop Objectives.**

- **Test Items**
  - For the same reasons as explained above under learning objectives, test items will need to be deleted or added.
  - Check each task element in the learning pyramid that is scheduled to be included in training and therefore to be tested. Make certain that you have a test item for each task element, and for only these task elements. To complete this process you should coordinate with the individual responsible for ISD II.2, Develop Tests.

IF YOU MODIFY THE ORIGINAL LEARNING ANALYSIS FOR ANY TASK, IT WILL BE NECESSARY FOR YOU TO RETURN TO BLOCK 11 OF THIS JOB AID TO VALIDATE THE NEW LEARNING ANALYSIS

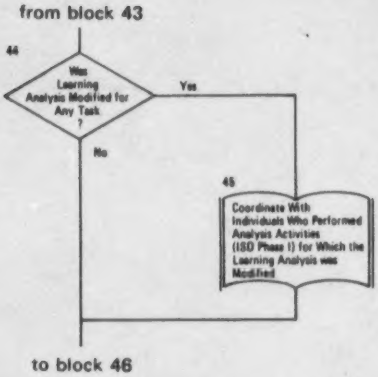

from block 39
43
Report to Supervisor
to block 44

- For further information, see below.

Why report to your supervisor?

You should report to your supervisor to show him the following information:

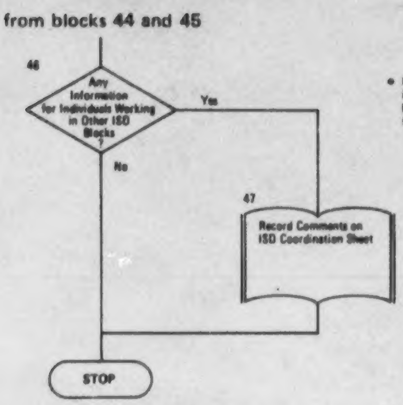
- An LAV Sheet with 3 levels of task elements identified: Level 1, Level 2 and BASIC Level.
- If necessary, a corrected learning analysis that accurately reflects the entry level skills and knowledge of trainees and the BASIC Level Task Elements.


from block 43
44
Was Learning Analysis Modified for Any Task ?
Yes
No
45
Coordinate With Individuals Who Performed Analysis Activities (ISD Phase I) for Which the Learning Analysis was Modified
to block 46

- Modification of the learning analysis may require changes in the products from previous ISD blocks.
- For further information, see below.

Why coordinate with individuals who performed analysis activities in ISD Phase I?

You should coordinate with these individuals to inform them of any changes made in the learning analysis. These individuals should determine if the changes affect the output of their ISD block. If so, the necessary revisions should be made. Revisions may also be necessary in the Soldier's Manual and the Commander's Manual.


from blocks 44 and 45
46
Any Information for Individuals Working in Other ISD Blocks ?
Yes
No
47
Record Comments on ISD Coordination Sheet
STOP

- During the learning analysis validation process information may have been obtained that would be useful to persons who will be engaged in the ISD steps that follow this one.

- Comments are recorded and submitted to appropriate persons.
- For further guidance, see below.

What is the importance of preparing comments for people working in other steps of the instructional systems development process? How do I record them?

- **In order for the Instructional Systems Development process to work effectively it is imperative that there be forward and backward communication between the people involved in the process. At some time or other you have probably complained about the input that has been provided to you. Sometimes, you may have had to do work that should have been performed in previous steps.**

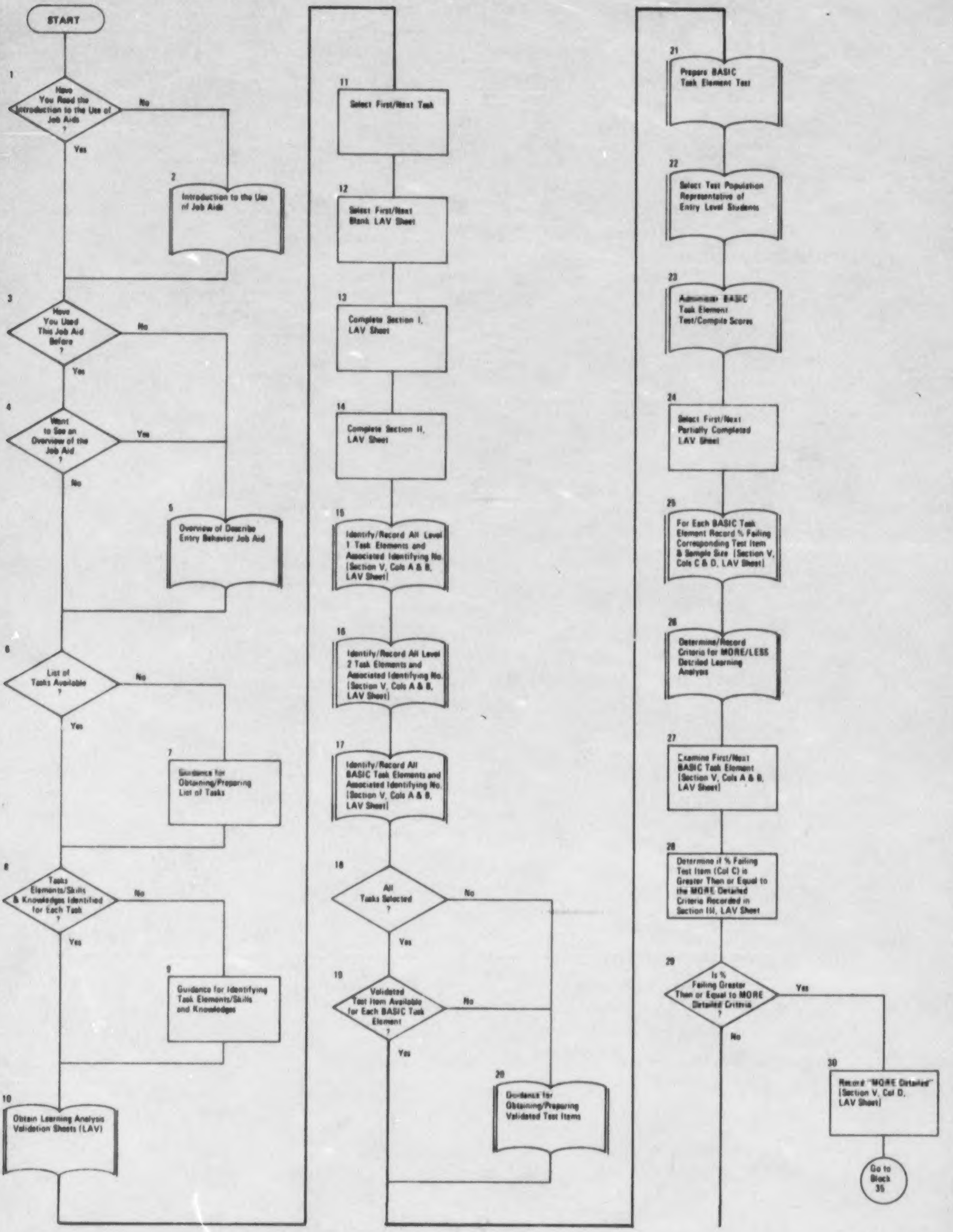
  IT IS IMPORTANT THAT YOU FEED THIS INFORMATION BACK TO THE APPROPRIATE PEOPLE SO THAT REVISIONS CAN BE MADE TO EFFECT IMPROVEMENT IN THE END PRODUCT.

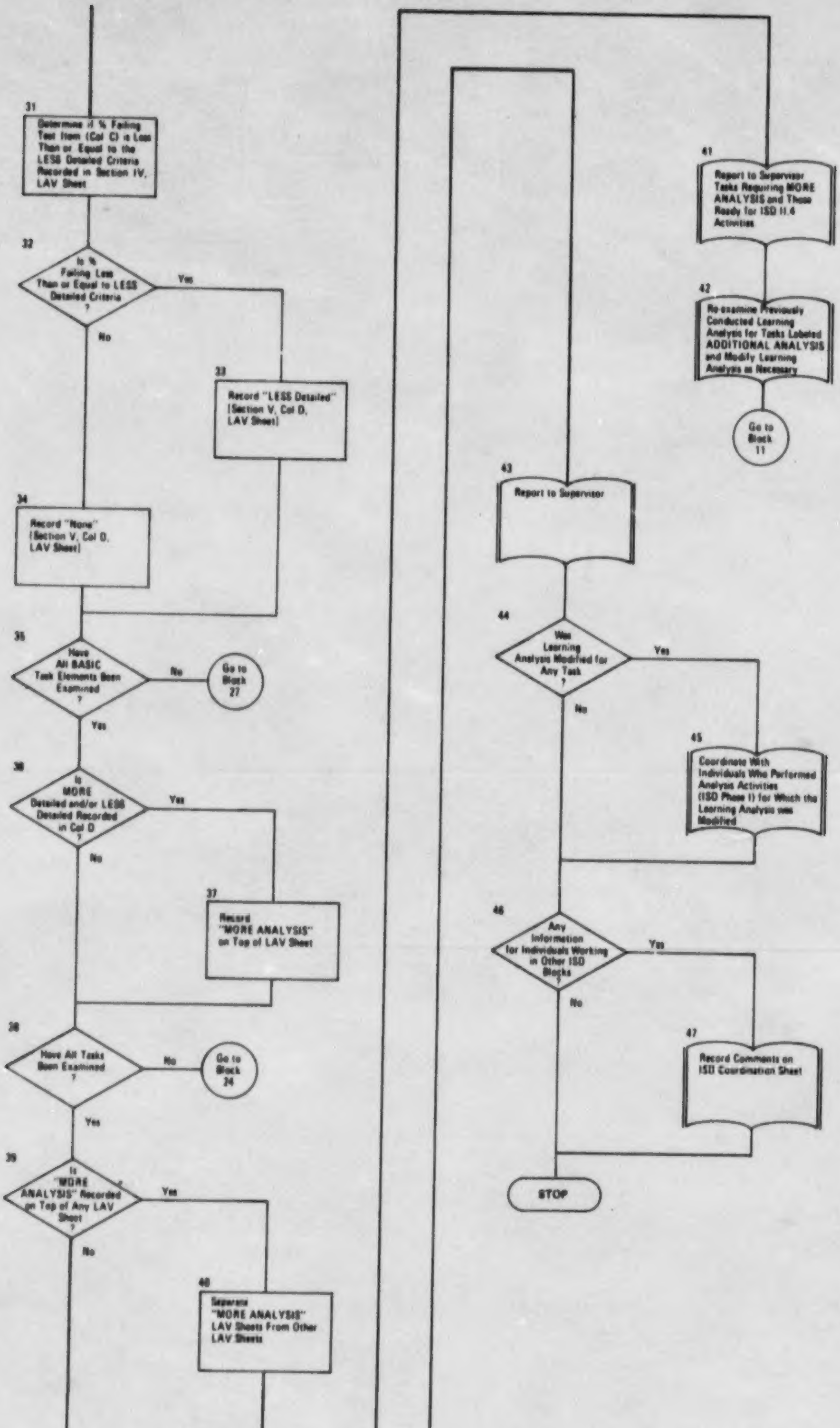
  In your research for this step of the Instructional Systems Development process you may have discovered additional information that you think may be useful to people who will be working in steps that follow this one. If so, it is equally important that you pass this information on to appropriate people.

  REMEMBER, COMMUNICATION WITHIN THE INSTRUCTION SYSTEMS DEVELOPMENT PROCESS IS CRITICAL FOR EFFECTIVE INSTRUCTIONAL DEVELOPMENT

- **A copy of the ISD COORDINATION SHEET can be found in the back of this manual. Make sufficient copies to enable you to send one to every individual you wish to communicate with—plus copies for your records.**

- **Complete the ISD COORDINATION SHEET in duplicate. Send one copy to the individual and attach one copy to the package of LOD Sheets.**


START
1
Have You Read the Introduction to the Use of Job Aids ?
No
Yes
2
Introduction to the Use of Job Aids
3
Have You Used This Job Aid Before ?
No
Yes
4
Want to See an Overview of the Job Aid ?
Yes
No
5
Overview of Describe Entry Behavior Job Aid
6
List of Tasks Available ?
No
Yes
7
Guidance for Obtaining/Preparing List of Tasks
8
Tasks Elements/Skills & Knowledges Identified for Each Task ?
No
Yes
9
Guidance for Identifying Task Elements/Skills and Knowledges
10
Obtain Learning Analysis Validation Sheets (LAV)
11
Select First/Next Task
12
Select First/Next Blank LAV Sheet
13
Complete Section I, LAV Sheet
14
Complete Section II, LAV Sheet
15
Identify/Record All Level 1 Task Elements and Associated Identifying No. [Section V, Cols A & B, LAV Sheet]
16
Identify/Record All Level 2 Task Elements and Associated Identifying No. [Section V, Cols A & B, LAV Sheet]
17
Identify/Record All BASIC Task Elements and Associated Identifying No. [Section V, Cols A & B, LAV Sheet]
18
All Tasks Selected ?
No
Yes
19
Validated Test Item Available for Each BASIC Task Element ?
No
Yes
20
Guidance for Obtaining/Preparing Validated Test Items
21
Prepare BASIC Task Element Test
22
Select Test Population Representative of Entry Level Students
23
Administer BASIC Task Element Test/Compile Scores
24
Select First/Next Partially Completed LAV Sheet
25
For Each BASIC Task Element Record % Failing Corresponding Test Item & Sample Size [Section V, Cols C & D, LAV Sheet]
26
Determine/Record Criteria for MORE/LESS Detailed Learning Analyses
27
Examine First/Next BASIC Task Element [Section V, Cols A & B, LAV Sheet]
28
Determine if % Failing Test Item (Col C) is Greater Then or Equal to the MORE Detailed Criteria Recorded in Section III, LAV Sheet
29
Is % Failing Greater Then or Equal to MORE Detailed Criteria ?
Yes
No
30
Record "MORE Detailed" [Section V, Col D, LAV Sheet]
Go to Block 35


31
Determine if % Failing Test Item (Col C) is Less Than or Equal to the LESS Detailed Criteria Recorded in Section IV, LAV Sheet
32
Is % Failing Less Than or Equal to LESS Detailed Criteria ?
Yes
No
33
Record "LESS Detailed" [Section V, Col D, LAV Sheet]
34
Record "None" [Section V, Col D, LAV Sheet]
35
Have All BASIC Task Elements Been Examined ?
No
Go to Block 27
Yes
36
Is MORE Detailed and/or LESS Detailed Recorded in Col D ?
Yes
No
37
Record "MORE ANALYSIS" on Top of LAV Sheet
38
Have All Tasks Been Examined ?
No
Go to Block 24
Yes
39
Is "MORE ANALYSIS" Recorded on Top of Any LAV Sheet ?
Yes
No
40
Separate "MORE ANALYSIS" LAV Sheets From Other LAV Sheets
41
Report to Supervisor Tasks Requiring MORE ANALYSIS and Those Ready for ISD II.4 Activities
42
Re-examine Previously Conducted Learning Analysis for Tasks Labeled ADDITIONAL ANALYSIS and Modify Learning Analysis as Necessary
Go to Block 11
43
Report to Supervisor
44
Was Learning Analysis Modified for Any Task ?
Yes
No
45
Coordinate With Individuals Who Performed Analysis Activities (ISD Phase I) for Which the Learning Analysis was Modified
46
Any Information for Individuals Working in Other ISD Blocks ?
Yes
No
47
Record Comments on ISD Coordination Sheet
STOP

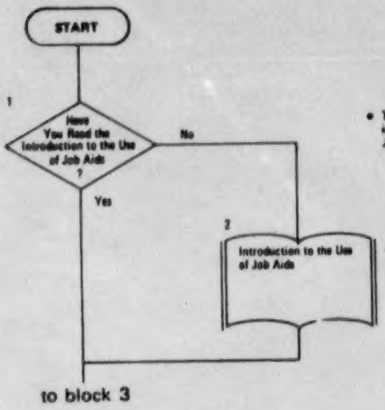
JOB AID FOR
DETERMINE SEQUENCE AND STRUCTURE

ISD II.4

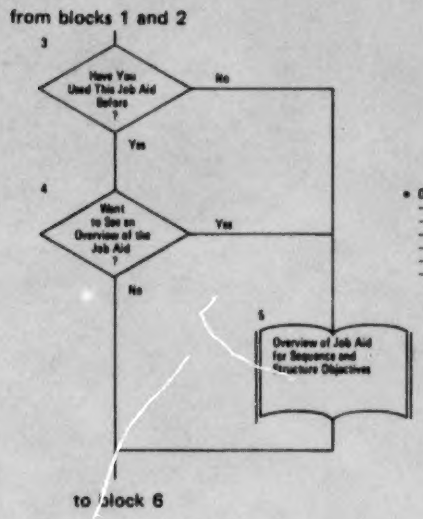
Manual

This is the 8th in a series of ISD Job Aids for use in instructional design and development. This volume is to be used as a supplement to the primary document, "Job Aids: Descriptive Authoring Flowcharts ISD II.4 Determine Sequence and Structure." The flowchart document will direct you to specific guidance, examples, and references provided in this volume. If you do not have the primary flowchart document, request it from your supervisor.

The wording in this manual should not be construed to discriminate between the sexes. In order to avoid a repetitious use of the terminology, "he/she," the terms, "he," "him," and "his," as well as "men," are intended to include both the masculine and feminine gender. Any exceptions to this usage will be so noted.


START
1
Have You Read the Introduction to the Use of Job Aids ?
No
Yes
2
Introduction to the Use of Job Aids
to block 3

- This introduction provides the user with instruction on the basic structure of the Job Aids and Guidance for their use.
- Refer to Introduction.


from blocks 1 and 2
3
Have You Used This Job Aid Before ?
No
Yes
4
Want to See an Overview of the Job Aid ?
Yes
No
5
Overview of Job Aid for Sequence and Structure Objectives
to block 6

- Overview includes:
  - Goal
  - Objectives
  - Products
  - Major steps in process
  - Worksheets used
  - Descriptive flowchart
- For detailed overview, see below.

What is the job aid for sequencying and grouping objectives all about?

- **GOAL**
  - The purpose of this job aid for sequencing and grouping learning objectives is to help assure that when instructional materials are developed, each learning objective is placed in the best relationship with other learning objectives to:
    - produce the most learning in the shortest period of time
    - help the soldier make the transition from one skill or body of knowledge to another
    - assure that the supporting knowledge and skills are acquired before dependent subject matter is introduced.
  - In short, your task in this block is to identify the NATURAL ORDER OF LEARNING that is inherent in the objectives you wish to train.

- **OBJECTIVES**

  1) Given a list of learning objectives, arrange them in the sequence in which instruction will be presented to the trainees.

  2) Given the sequenced learning objectives, arrange them into major groups to simplify further handling of broader content areas, i.e., modules, chapters, sections, etc.

- **OVERVIEW OF MAJOR STEPS IN SEQUENCING AND GROUPING OBJECTIVES**

Step 1. Sequence the learning objectives for each task in which the following relationships between objectives are shown:

a) dependent
b) supportive
c) independent

Step 2. Group terminal learning objectives by instructional setting

Step 3. Determine appropriate sequence of terminal learning objectives

Step 4. Structure terminal learning objectives into groups

Step 5. Identify and group learning objectives which are identical between tasks or elements/skills and knowledges

Step 6. Identify and group learning objectives which have common elements

- **PRODUCTS**

Use of this job aid will result in the assignment of a group letter (i.e., A, B, C, D, etc.) and sequence number for every TLO and LO in the course for which you are developing instruction.

- **WORKSHEETS USED**

The worksheets used in this job aid are the same as used in the job aid for ISD II.1 Develop Objectives. They are:

—Learning Objectives Documentation Sheet (LOD Sheet) (See example on next page)

EXAMPLE:

TLO Sequence #: 1
TLO Group Letter: A

ISD II.1 Develop Objectives

LEARNING OBJECTIVES DOCUMENTATION SHEET

(LOD Sheet)

SECTION I

Name/Office Symbol SFC Albert Johnson Date 11/30/78
Course Land Navigation Skills

SECTION II

Task ID No 330-575-1008 Institution

TERMINAL LEARNING OBJECTIVE

Action Statement the trainee will hike from point A to point B
Conditions Statement given a map, compass and hiking pack
Standards Statement within 3 hours

SECTION III

(A) Element/Enabling Skills and Knowledges	(B) Learning Objective Required?	(C) Learning Objective (Action, Conditions & Standards)	(D) Learning Category/ Sub Category	(E) Group Letter/ Sequence Number
1 A Orient map and compass	1008 A	Given a map and a compass in unfamiliar terrain, the trainee will orient the map according to magnetic North	M/rule learning & using	A-1
2 A.1 Interpret map	1008 A.1	When located in unfamiliar terrain, the trainee will select the correct map for the terrain from a group of 5 maps	M/rule learning & using	A-2
3 A.1.1 Use legend	1008 A.1.1	When located in unfamiliar terrain, the trainee will point out 5 actual terrain features which correspond to the map symbols	M/ classifying	A-3
4 A.1.1.1 Match symbols to actual terrain	1008 A.1.1.1	Given a series of photos of actual terrain features, the trainee will sort them into groups under the appropriate symbol	M/ discriminating	A-4
5 A.1.1.2 Match symbols to legend	1008 A.1.1.2	Given a map, the trainee will match the symbols to the map legend by drawing connecting lines from the symbol to the legend	M/identifying objects & symbols	A-5
6 A.1.1.1.1 Identify symbols	1008 A.1.1.1.1	Given 12 examples of map symbols, state what the symbols indicate. All 12 must be identified correctly.	M/identifying objects & symbols	A-6
7 A.1.1.1.1.1 Identify colors	none			
8 A.1.1.1.1.2 Identify shapes	none			
9 A.2 Use compass	1008 A.2	Given a compass in unfamiliar terrain, the trainee will determine the directions: North, East, South and West, from his location	M/rule learning & using	A-7
10 A.2 enabling skills and knowledges not shown				
11				
12				
13				
14 B Hike with pack	1008 B	Given a 40 lb backpack, the trainee will hike non-stop from point A to point B within 3 hours	P/gross motor skill	A-8

— Terminal Learning Objective LP Card (white)
— Learning Objective LP Card (yellow)

See below for completed examples.

TERMINAL LEARNING OBJECTIVE LP CARD

Task # 330-575-1008
Instructional Setting INSTITUTION
Learning Objective # 1008

Group Letter A
Sequence # 1

Action Statement:

hike from point A to point B

(white card)

LEARNING OBJECTIVE LP CARD

Task # 330-575-1008
Element/Enabling S&K # A
Learning Category/Subcategory M/rule learning + using
Learning Objective # 1008-A

LO Sequence # 1
LO Group Letter A
TLO Sequence # 1
TLO Group Letter A

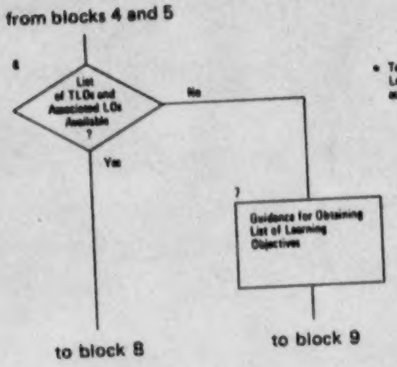
Action Statement:

Orient map & compass

(yellow card)

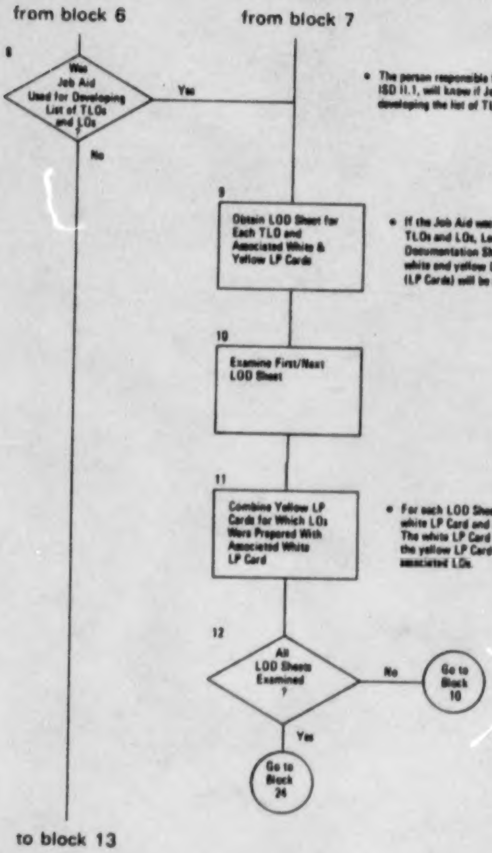
- **DESCRIPTIVE FLOWCHART**

  — The flowchart on pages H-49 thru H-50 shows the major steps in the use of the Job Aid for Sequencing and Grouping Objectives. The flowchart will be useful to you in getting a clear picture of the overall process used in this job aid. A more completely described flowchart is provided in Job Aids: Descriptive Authoring Flowcharts, pages H-3 thru H-12.


from blocks 4 and 5
6
List of TLOs and Associated LOs Available ?
No
Yes
7
Guidance for Obtaining List of Learning Objectives
to block 8
to block 9

- Terminal Learning Objectives (TLOs) and Learning Objectives (LOs) should be available as output from ISD II.1, Develop Objectives.

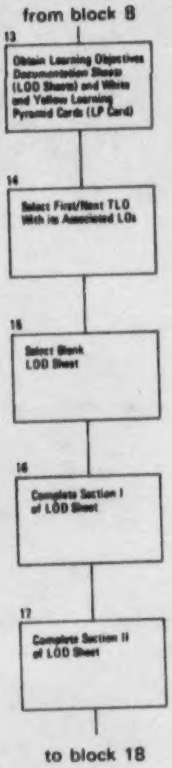
- If TLOs and LOs are not available, request them from the person responsible for developing objectives in ISD II.1.
- When TLOs and LOs have been obtained, return to Descriptive Authoring Flowchart II.4, Determine Sequence & Structure, Block 6.


from block 6
from block 7
8
Was Job Aid Used for Developing List of TLOs and LOs ?
Yes
No
9
Obtain LOD Sheet for Each TLO and Associated White & Yellow LP Cards
10
Examine First/Next LOD Sheet
11
Combine Yellow LP Cards for Which LOs Were Prepared With Associated White LP Card
12
All LOD Sheets Examined ?
No
Go to Block 10
Yes
Go to Block 24
to block 13

- The person responsible for developing objectives, ISD II.1, will know if Job Aids were used for developing the list of TLOs and LOs.

- If the Job Aid was used for developing TLOs and LOs, Learning Objectives Documentation Sheets (LOD Sheets) and white and yellow Learning Pyramid Cards (LP Cards) will be available as output.

- For each LOD Sheet there should be one white LP Card and several yellow LP Cards. The white LP Card represents the TLO and the yellow LP Card represents the associated LOs.

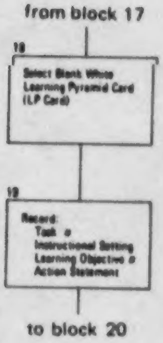


from block 8
13
Obtain Learning Objectives Documentation Sheets (LOD Sheets) and White and Yellow Learning Pyramid Cards (LP Card)
14
Select First/Next TLO With its Associated LOs
15
Select Blank LOD Sheet
16
Complete Section I of LOD Sheet
17
Complete Section II of LOD Sheet
to block 18

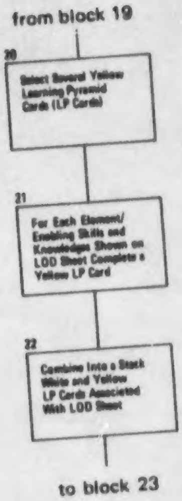
- LOD Sheets and white and yellow LP Cards are available for duplication in the *packet at the back of Job Aid for Developing Objectives Manual.*

- For guidance see Block 12, page E-5, Descriptive Authoring Flowcharts, ISD II.1 Develop Objectives.

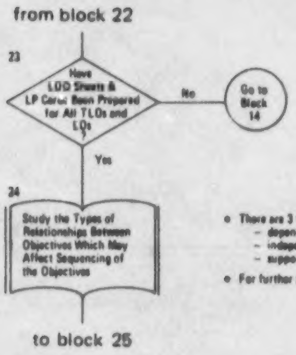
- For guidance see Blocks 14-17, pages E-5 & E-6, Descriptive Authoring Flowcharts, ISD II.1 Develop Objectives.


from block 17
18
Select Blank White Learning Pyramid Card (LP Card)
19
Record:
Task #
Instructional Setting
Learning Objective #
Action Statement
to block 20

- Guidance is available in Block 19, page E-5, Descriptive Authoring Flowcharts, ISD II.1 Develop Objectives.


from block 19
20
Select Several Yellow Learning Pyramid Cards (LP Cards)
21
For Each Element/Enabling Skills and Knowledges Shown on LOD Sheet Complete a Yellow LP Card
22
Combine Into a Stack White and Yellow LP Cards Associated With LOD Sheet
to block 23

- The information required on the yellow LP Card is:
  - Task #
  - Element/Enabling S&K #
  - Learning Category/Subcategory
  - Learning Objective #
  - Action Statement
- The above information is available from the LOD Sheet.
- Group Letter and Sequence # is left blank at this point.


from block 22
23
Have LDD Sheets & LP Cards Been Prepared for All TLOs and LOs?
No
Go to Block 14
Yes
24
Study the Types of Relationships Between Objectives Which May Affect Sequencing of the Objectives
to block 25

- There are 3 types of relationships:
  - dependent
  - independent
  - supportive
- For further explanation, see below.

How do I determine the relationships between objectives?

- Keep in mind that there are no hard and fast rules for sequencing objectives. However, there are rules of thumb which will help you devise a reasonable sequence.

- In order to sequence two learning objectives, you must first determine the relationship between them. Two learning objectives may have:

  1) a dependent relationship, in that mastery of one requires prior mastery of the other.

  2) an independent relationship, in that they are totally unrelated and independent of each other; or

  3) a supportive relationship, in that some transfer of learning takes place from one learning objective to the other.

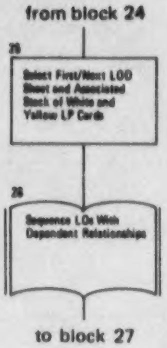
- The table on the next page contrasts the three types of dependent, independent and supportive relationships. The table also provides examples of each of these relationships and shows how the relationship affects sequencing.

Types of Relationships Between Learning Objectives

DEPENDENT	INDEPENDENT	SUPPORTIVE
Skills and knowledges in one learning objective are closely related to those in the other learning objective.	Skills and knowledges in one learning objective are unrelated to those in the other learning objective.	Skills and knowledges in one learning objective have some relationship to those in the other learning objective.
To master one of the learning objectives, it is first necessary to master the other.	Mastering one of the learning objectives does not simplify mastering the other.	The learning involved in mastery of one learning objective transfers to the other, making learning involved in the mastery of the other easier.
EXAMPLES: In math, in order to learn multiplication one must first learn addition. One cannot send messages in Morse Code without first having mastered the codes for each of the letters and numbers. The "sending" skills are totally dependent on the prior learning.	EXAMPLES: For a clerk typist, "type letters from drafts" is independent of "maintain files." For a wheeled vehicle mechanic, "adjust carburetor" is independent of "torque engine head studs." In both examples, knowing how to do one would not help much with the other.	EXAMPLES: "Assemble weapon" has a supportive relationship to "disassemble weapon." "Drive a 1/4 ton truck" has a supportive relationship to "drive a 2-1/2 ton vehicle." In both examples, learning to do one would help considerably in learning to do the other.
The learning objectives must be arranged in the sequence indicated by the above hierarchy.	In general, the learning objectives can be arranged in any sequence without loss of learning.	The learning objectives should be placed close together in the sequence to permit optimum transfer of learning from one learning objective to the other.

- Some effects of sequencing are:

1. Sequencing effects are long-range. The advantages or disadvantages of using any sequencing scheme will not likely show up immediately. Therefore, end-of-course tests should be used for evaluating effectiveness of sequencing techniques. Within-course tests of small portions of the course are not likely to reveal the true effects of sequence.
2. Sequence is important to low-aptitude students. Students who have a high aptitude for the subject matter will learn it in spite of sequencing. The lower aptitude of the learner for the content, the more important it becomes that some type of sequence and structure is provided.
3. Sequence is important with unfamiliar materials. Students who are familiar with materials will learn regardless of order of presentationn But as material becomes increasingly unfamiliar to the student, the importance of sequence increases.
4. Sequence is important with non-redundant materials. Some instructional materials are especially redundant, stating important points over and over again. Sequencing is not especially important with these materials, because the student can pick up the second time anything he has missed the first time. But if materials are non-redundant and state their points only once, it is important that the materials be sequenced according to some rationale.


from block 24
25
Select First/Next LOO Sheet and Associated Stack of White and Yellow LP Cards
26
Sequence LOs With Dependent Relationships
to block 27

- Two or more objectives may have a dependent relationship: mastery of one requires prior mastery of the other.
- For further guidance on how to sequence objectives with dependent relationships, see below.

How do I sequence objectives with Dependent relationships?

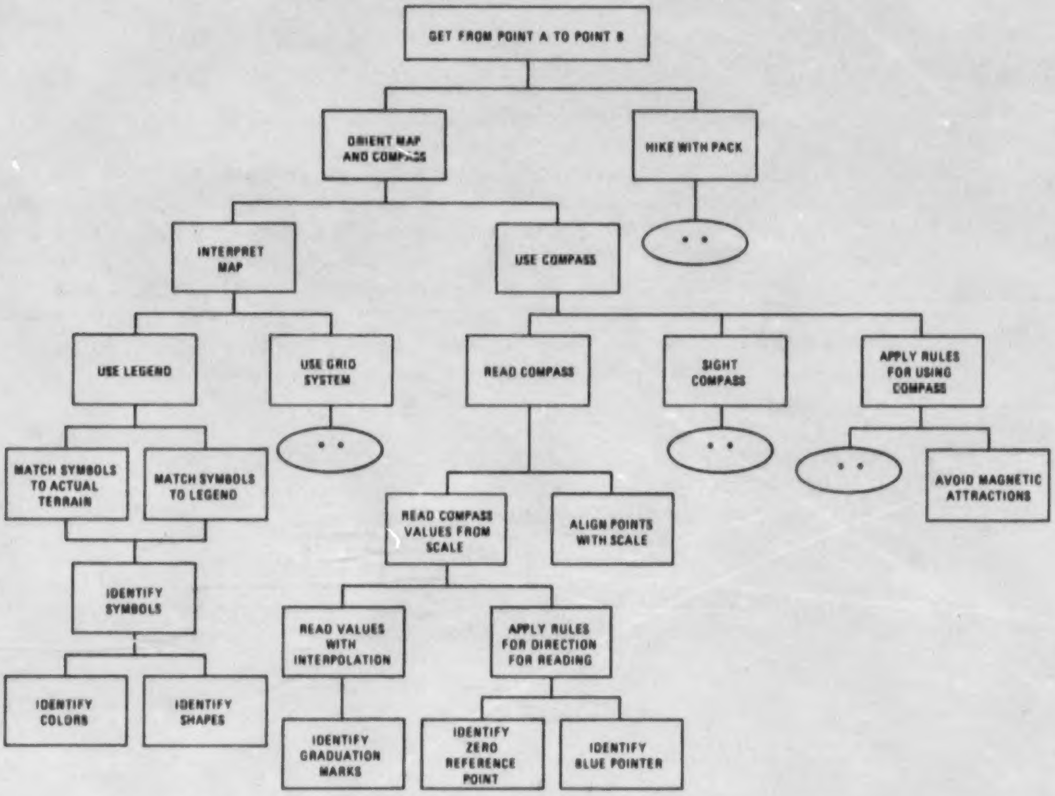
- Sequencing learning objectives that support a TLO.

1) Review each Learning Objective LP Card on which you have an action statement to determine if certain skills and knowledges are prerequisites for others. Ask the question, "What other skills or knowledges must the student have in order to accomplish this task?" The answer to this question will help you identify the proper sequence for prerequisite objectives. The simpler prerequisite objectives should be sequenced before the higher-level (complex) objectives of which they are a part. For example, before a person can multiply, he must be able to add. Learning how to add is a prerequisite for multiplying.

2) Arrange and rearrange the Learning Objective LP cards until you are sure the enabling skills and knowledges (prerequisite objectives) are placed before the higher level more complex objectives. In other words, construct a shorthand pyramid.

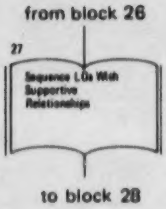
   — For example, a terminal learning objective with its learning objectives might look like this when the cards have been arranged. (See next page)

Shorthand Pyramid Displaying Learning Analysis


GET FROM POINT A TO POINT B
ORIENT MAP AND COMPASS
HIKE WITH PACK
• •
INTERPRET MAP
USE COMPASS
USE LEGEND
USE GRID SYSTEM
• •
READ COMPASS
SIGHT COMPASS
• •
APPLY RULES FOR USING COMPASS
• •
AVOID MAGNETIC ATTRACTIONS
MATCH SYMBOLS TO ACTUAL TERRAIN
MATCH SYMBOLS TO LEGEND
READ COMPASS VALUES FROM SCALE
ALIGN POINTS WITH SCALE
IDENTIFY SYMBOLS
READ VALUES WITH INTERPOLATION
APPLY RULES FOR DIRECTION FOR READING
IDENTIFY COLORS
IDENTIFY SHAPES
IDENTIFY GRADUATION MARKS
IDENTIFY ZERO REFERENCE POINT
IDENTIFY BLUE POINTER

— Note that before you can master the TLO of "get from Point A to Point B," you must be able to do two learning objectives: "orient map and compass," and "hike with a pack." Some of the learning objectives under "orient map have dependent relationships. These hierarchically-ordered objectives are, therefore, easy to sequence. One sequence is:

1. Identify symbols
2. a. Match symbols to actual terrain
   b. Match symbols to legend
3. a. Use legend
   b. Use grid system
4. Interpret map



- Two or more objectives may have a supportive relationship: some transfer of learning takes place from one LO to the other.
- For further guidance on how to sequence objectives with supportive relationships, see below.

How do I sequence objectives with supportive relationships?

1) Continue to study the Learning Objective LP cards which make up the shorthand pyramid for this task.

2) Arrange objectives with supportive relationships as close together in the sequence as practical so that optimum transfer of learning can take place.

3) Arrange objectives close together if the conditions under which the learning objectives are carried out are identical or similar, and if the conditions are difficult or expensive to produce at random times. For example, if several learning objectives have conditions such as "at night," "on muddy terrain," or "when flying at an altitude of 20,000 feet," you will probably wish to place the "at night" learning objectives together, the "on muddy terrain" learning objectives together, etc.

4) Arrange objectives close together if a particular piece of equipment must be available in order to accomplish a group of learning objectives, and if you are not likely to have continuous access to that equipment, you will probably wish to group the learning objectives that use that particular equipment. In addition, you will want to keep the order of the group of learning objectives within the total program as flexible as possible. For example, if the learning objective is "perform maintenance on helicopter," you will have to wait until the helicopter is available for maintenance before you can accomplish the objective.

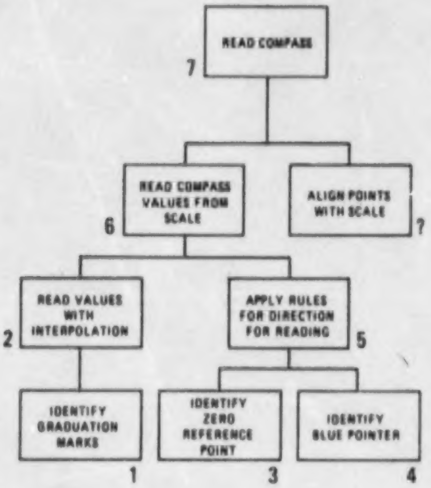
from block 27
28
Sequence LOs With Independent Relationships
to block 29

- Two or more objectives may have an independent relationship: they are totally unrelated to each other.
- For further guidance on how to sequence objectives with independent relationships, see below.

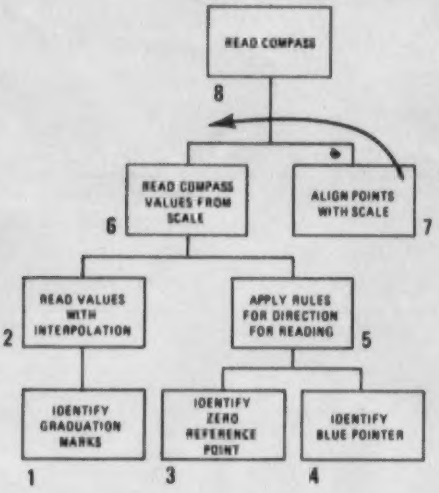
How do I sequence objectives with independent relationships?

1) Learning objectives with independent relationships may be arranged in any sequence. Any of the guidelines listed for sequencing learning with a supportive relationship may also be used for sequencing objectives with independent relationships. However, with the latter, you need not be concerned about locating the learning objectives close together in the sequence unless condition or equipment constraints indicate otherwise.

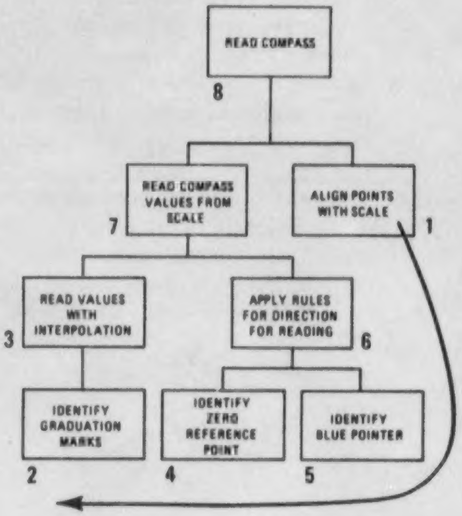
2) Some of the learning objectives present more of a sequencing problem, however. In an example below, which should be placed first, "read compass values from scale" or "align points with scale?" These can be placed in either order, so long as they are both placed before "read compass," and as long as "read compass from scale" comes after the five learning objectives under it.

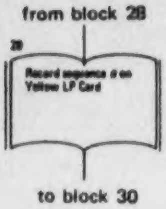

READ COMPASS
7
READ COMPASS VALUES FROM SCALE
6
ALIGN POINTS WITH SCALE
?
READ VALUES WITH INTERPOLATION
2
APPLY RULES FOR DIRECTION FOR READING
5
IDENTIFY GRADUATION MARKS
1
IDENTIFY ZERO REFERENCE POINT
3
IDENTIFY BLUE POINTER
4

However, if you place "align points with scale" within learning objective 1 through 6, you would interfere with the dependent sequence of those learning objectives. Therefore, unless you had a good reason for doing otherwise, you would place "align points" either after "read compass values from scale" or before the group of learning objectives that have a dependent relationship to "read compass values from scale."


READ COMPASS
8
READ COMPASS VALUES FROM SCALE
6
ALIGN POINTS WITH SCALE
7
READ VALUES WITH INTERPOLATION
2
APPLY RULES FOR DIRECTION FOR READING
5
IDENTIFY GRADUATION MARKS
1
IDENTIFY ZERO REFERENCE POINT
3
IDENTIFY BLUE POINTER
4

OR


READ COMPASS
8
READ COMPASS VALUES FROM SCALE
7
ALIGN POINTS WITH SCALE
1
READ VALUES WITH INTERPOLATION
3
APPLY RULES FOR DIRECTION FOR READING
6
IDENTIFY GRADUATION MARKS
2
IDENTIFY ZERO REFERENCE POINT
4
IDENTIFY BLUE POINTER
5



- For further guidance, see below.

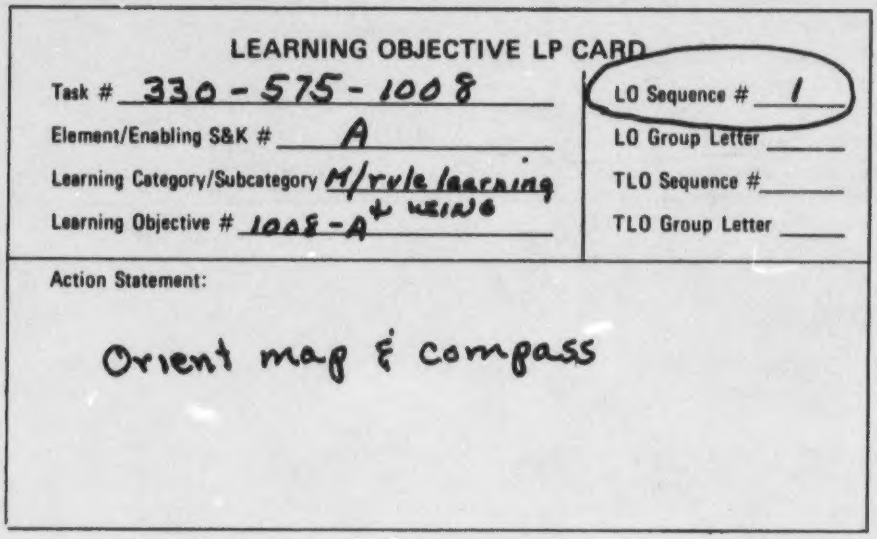
What purpose does the sequence number serve?

- In blocks 26, 27 and 28 you sequenced the LOs for this TLO by the types of relationships between the LOs. You determined that some LOs must be trained before others because of their dependent relationships; others should be presented together because of their supportive relationships; and for some the order of presentation is not important. The sequence number you assign in this block is a documentation of this sequencing. It represents a first judgment of the order in which the LOs should be addressed in training. In later blocks (blocks 37 and 40) you may find that this order needs to be modified. For example, you may find that a LO represented in this TLO may be represented in another TLO. If so, you will probably not wish to give training for the LO for every TLO in which it is represented. The judgment as to where it is best trained will be made later. In this block you will make only the first judgment.

How do I assign the LO sequence number and where do I record it?

- The LO Sequence number is recorded in the upper right corner of the Learning Objective LP Card.
- Start with the LO that you have determined should be trained first when this TLO is being presented to the student. Record a LO Sequence number of "1" to this LO on the corresponding Learning Objective LP Card. Record a LO Sequence number of "2" to the LO that should be trained second. Continue this procedure until sequence number has been recorded for all LOs for this TLO.

What does the Learning Objective LP Card look like after the LO Sequence number has been filled in?



LEARNING OBJECTIVE LP CARD

Task # 330-575-1008

Element/Enabling S&K # A

Learning Category/Subcategory M/rule learning + using

Learning Objective # 1008-A

LO Sequence # 1

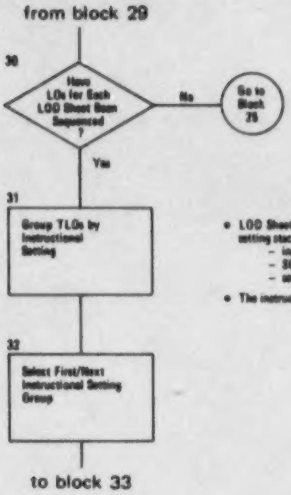
LO Group Letter ____

TLO Sequence # ____

TLO Group Letter ____

Action Statement:

Orient map & compass


from block 29
30
Have LOs for Each LOD Sheet Been Sequenced ?
No
Go to Block 25
Yes
31
Group TLOs by Instructional Setting
32
Select First/Next Instructional Setting Group
to block 33

- LOD Sheets and associated LP Cards are sorted into three instructional setting stacks:
    - institution
    - SOJT
    - self study
- The instructional setting is shown on the LOD Sheets and LP Cards.

from block 32
33
Determine Sequence of TLOs
to block 34

- Cards on which TLO action statements have been recorded are arranged to graphically show the relationships of all TLOs covered in the course under development for a particular instructional setting.
- For further guidance on determining sequence of TLOs, see below.

How do I sequence TLOs?

- The same guidance for sequencing LOs applies to the sequencing of TLOs.
  - Arrange the Terminal Learning Objective LP cards into a new shorthand pyramid. It is impractical to rearrange accompanying LOs, however, keep in mind that when you place a particular terminal learning objective in a certain position in the sequence, you will later locate the learning objectives that support the terminal learning objective with it. This is because of the dependent relationship of the learning objective to the terminal learning objective, and because of the transfer of learning that is more likely to occur when closely related learning objectives are kept together.
  - For example: One terminal learning objective might be to operate a certain piece of equipment, while another terminal learning objective might be to instruct others in the proper operation of the equipment. Most likely a dependent relationship exists between these two terminal learning objectives; therefore, you would place "operate equipment" before "instruct others." The guidelines for sequencing supportive and independent TLOs are likewise the same as given for LOs.

from block 33
34
Assign TLO Sequence #
to block 35

- *For further guidance, see below.*

How do I assign and record terminal learning objective sequence numbers?

- Assign a TLO Sequence number of "1" to the TLO which is to be trained first; a "2" to the TLO to be trained second; etc.
- Record the TLO Sequence number in the upper right corner of the following forms:
  - — Learning Objective Documentation (LOD) Sheet
  - — Terminal Learning Objective LP Card
  - — All Learning Objective LP Cards associated with each TLO

What does the terminal learning objective LP Card look like after the TLO sequence number has been recorded on it?

EXAMPLE:

TERMINAL LEARNING OBJECTIVE LP CARD

Task # 330-575-1008

Instructional Setting INSTITUTION

Learning Objective # 1008

Group Letter ______

Sequence # 1

Action Statement:

hike from point A to point B

What does the Learning Objective Documentation Sheet look like after the TLO sequence number has been recorded on it?

TLO Sequence #: 1

ISD II.1 Develop Objectives

LEARNING OBJECTIVES DOCUMENTATION SHEET

(LOD Sheet)

SECTION I

Name/Office Symbol SFC Albert Johnson Date 11/30/78

Course Land Navigation Skills

SECTION II

Task ID No 330-575-1008 Institution

TERMINAL LEARNING OBJECTIVE

Action Statement the trainee will hike from point A to point B

Conditions Statement given a map, compass and hiking pack

Standards Statement within 3 hours

SECTION III

(A) Element/Enabling Skills and Knowledges	(B) Learning Objective Required?	(C) Learning Objective (Action, Conditions & Standards)	(D) Learning Category/ Sub Category	(E) Group Letter/ Sequence Number
1 A Orient map and compass	1008 A	Given a map and a compass in unfamiliar terrain, the trainee will orient the map according to magnetic North	M/rule learning & using	
2 A.1 Interpret map	1008 A.1	When located in unfamiliar terrain, the trainee will select the correct map for the terrain from a group of 5 maps	M/rule learning & using	
3 A.1.1 Use legend	1008 A.1.1	When located in unfamiliar terrain, the trainee will point out 5 actual terrain features which correspond to the map symbols	M/classifying	
4 A.1.1.1 Match symbols to actual terrain	1008 A.1.1.1	Given a series of photos of actual terrain features, the trainee will sort them into groups under the appropriate symbol	M/discriminating	
5 A.1.1.2 Match symbols to legend	1008 A.1.1.2	Given a map, the trainee will match the symbols to the map legend by drawing connecting lines from the symbol to the legend	M/identifying objects & symbols	
6 A.1.1.1.1 Identify symbols	1008 A.1.1.1.1	Given 12 examples of map symbols, state what the symbols indicate. All 12 must be identified correctly.	M/identifying objects & symbols	
7 A.1.1.1.1.1 Identify colors	none			
8 A.1.1.1.1.2 Identify shapes	none			
9 A.2 Use compass	1008 A.2	Given a compass in unfamiliar terrain, the trainee will determine the directions: North, East, South and West, from his location	M/rule learning & using	
10 A.2 enabling skills and knowledges not shown				
11				
12				
13				
14 B Hike with pack	1008 B	Given a 40 lb backpack, the trainee will hike non-stop from point A to point B within 3 hours	P/gross motor skill	

What does a Learning Objective LP Card look like after the TLO sequence number has been recorded on it?

LEARNING OBJECTIVE LP CARD

Task # 330-575-1008	LO Sequence # 1
Element/Enabling S&K # A	LO Group Letter
Learning Category/Subcategory M/rule learning ↓ using	TLO Sequence # 1
Learning Objective # 1008-A	TLO Group Letter

Action Statement:

Orient map & compass

from block 34
35
Structure TLOs into Groups
to block 36

- Grouping of objectives provides organized, manageable blocks of contact
- For further guidance on how to group objectives, see below

How do I structure terminal learning objectives into groups?

- While sequencing TLOs, you undoubtedly realized that you were dealing with quite a few items; so many in fact, that you might have had difficulty in getting a clear picture of the relationship between all of them. You can partially overcome this difficulty by dividing the TLOs into large groups that will provide organized manageable blocks of content with which you can work. How many TLOs you group into a block is an arbitrary matter. At this point, you are simply identifying TLOs that can be grouped because of the close relationship between the learning objectives involved.

- Advantages of grouping (structuring) TLOs

  1) Grouping content areas early will help you get a clearer picture of the scope and nature of your developing program.

  2) Grouped TLOs can be worked on independently. If one person is responsible for development of the total system, he can work on later groups if all the material is not available for earlier groups.

  3) When more than one person is assigned to develop course materials, different people can be assigned responsibility for different groups. Each person then can work relatively independently on a group of learning objectives, conferring with others as needed.

- Guidelines to help in dividing TLOs into groups

  1) For a particular group, select learning objectives that bear a close relationship to each other. Combined, they should make a self-contained group.

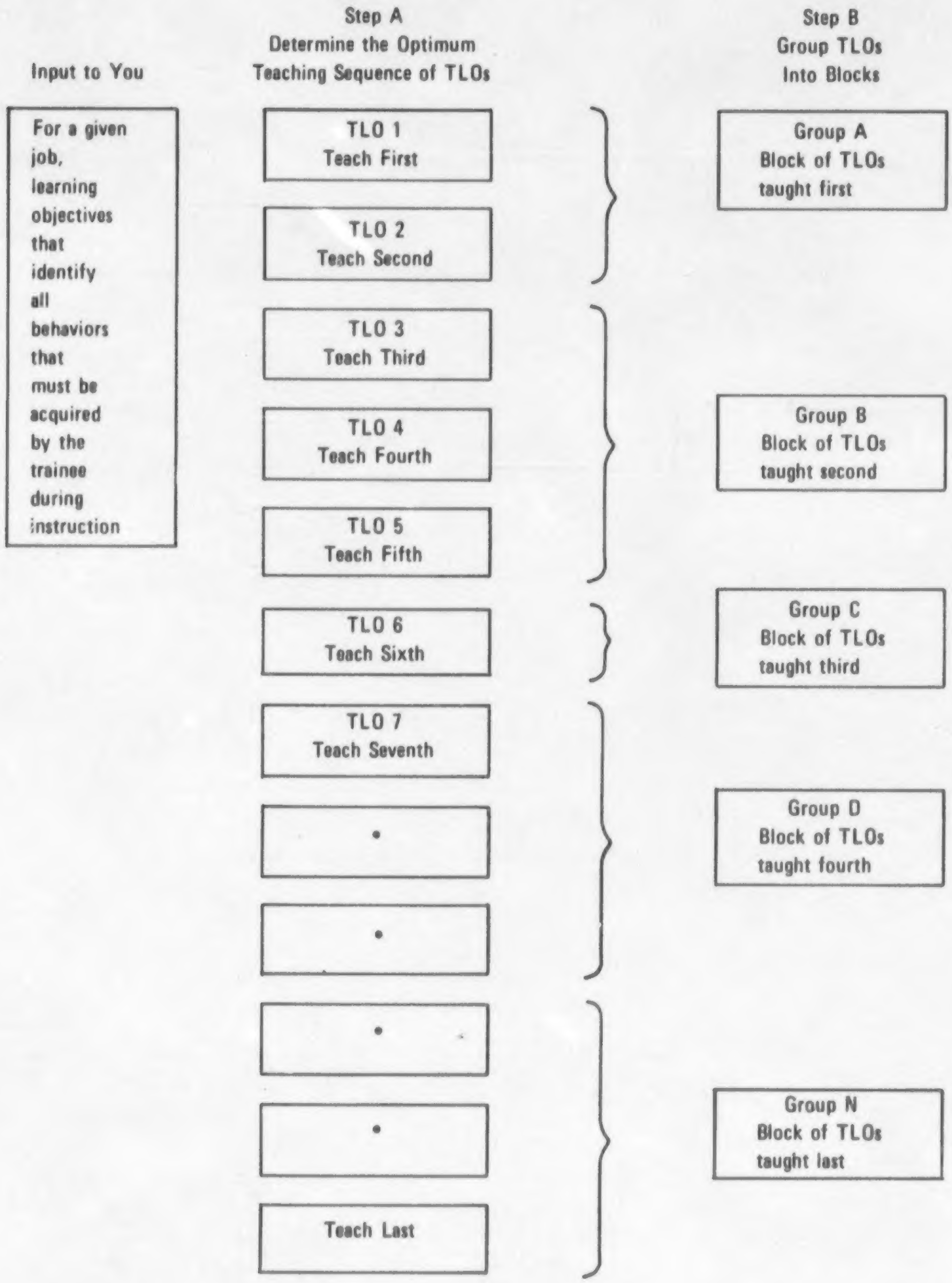
  2) Combine learning objectives so that the group has a natural beginning and ending point.

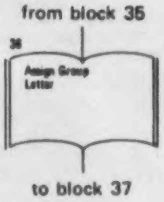
  3) Be sure all learning objectives are included somewhere. In general, learning objectives within your groups will remain in exactly the same order as your original sequence. However, since dividing learning objectives into groups should help clarify your total program, do not hesitate to re-sequence objectives where necessary.

  4) Do not assume that your group of learning objectives is unalterable. Subsequent decisions may require you to re-evaluate what should constitute a group.

- Procedure: Sort the Terminal Learning Objectives LP Cards into groups by using the guidelines on the previous page. See example below.

EXAMPLE: TLOs which have been sequenced and structured into groups.


Input to You
Step A
Determine the Optimum
Teaching Sequence of TLOs
Step B
Group TLOs
Into Blocks
For a given job, learning objectives that identify all behaviors that must be acquired by the trainee during instruction
TLO 1
Teach First
TLO 2
Teach Second
TLO 3
Teach Third
TLO 4
Teach Fourth
TLO 5
Teach Fifth
TLO 6
Teach Sixth
TLO 7
Teach Seventh
•
•
•
•
Teach Last
Group A
Block of TLOs
taught first
Group B
Block of TLOs
taught second
Group C
Block of TLOs
taught third
Group D
Block of TLOs
taught fourth
Group N
Block of TLOs
taught last



- For further guidance, see below.

How do I assign group letters to terminal learning objectives?

- Now that you have determined which TLOs can be sorted into related groups you are to assign an alphabetical letter to each of these groups. The group of TLOs that are to be trained first should be assigned a group letter "A". Those trained second, "B", etc. Continue this procedure until all groups have been assigned a group letter. The example on the preceding page illustrates the assignment of group letters.

Where do I record the terminal learning objective group letters?

- The group letter is recorded in three places:
  1) In the upper right corner of all Terminal Learning Objective LP Cards included in the group
  2) In the upper right corner of all Learning Objective Documentation (LOD) Sheets included in the group of TLOs
  3) All Learning Objective LP Cards associated with each TLO

What does a Terminal Learning Objective LP Card look like after the TLO group letter has been recorded on it?

EXAMPLE:

TERMINAL LEARNING OBJECTIVE LP CARD

Task # 330-575-1008

Instructional Setting INSTITUTION

Learning Objective # 1008

Group Letter A

Sequence # 1

Action Statement:

hike from point A to point B

What does a Learning Objective Documentation (LOD) Sheet look like after the TLO group letter has been recorded on it?

EXAMPLE:

TLO Sequence # 1
TLO Group Letter: A

ISD II.1 Develop Objectives

LEARNING OBJECTIVES DOCUMENTATION SHEET

(LOD Sheet)

SECTION I

Name/Office Symbol SFC Albert Johnson Date 11/30/78
Course Land Navigation Skills

SECTION II

Task ID No 330-575-1008 Institution

TERMINAL LEARNING OBJECTIVE

Action Statement the trainee will hike from point A to point B
Conditions Statement, given a map, compass and hiking pack
Standards Statement within 3 hours

SECTION III

(A) Element/Enabling Skills and Knowledges	(B) Learning Objective Required?	(C) Learning Objective (Action, Conditions & Standards)	(D) Learning Category/ Sub Category	(E) Group Letter/ Sequence Number
1 A Orient map and compass	1008 A	Given a map and a compass in unfamiliar terrain, the trainee will orient the map according to magnetic North	M/rule learning & using	
2 A.1 Interpret map	1008 A.1	When located in unfamiliar terrain, the trainee will select the correct map for the terrain from a group of 5 maps	M/rule learning & using	
3 A.1.1 Use legend	1008 A.1.1	When located in unfamiliar terrain, the trainee will point out 5 actual terrain features which correspond to the map symbols	M/classifying	
4 A.1.1.1 Match symbols to actual terrain	1008 A.1.1.1	Given a series of photos of actual terrain features, the trainee will sort them into groups under the appropriate symbol	M/discriminating	
5 A.1.1.2 Match symbols to legend	1008 A.1.1.2	Given a map, the trainee will match the symbols to the map legend by drawing connecting lines from the symbol to the legend	M/identifying objects & symbols	
6 A.1.1.1.1 Identify symbols	1008 A.1.1.1.1	Given 12 examples of map symbols, state what the symbols indicate. All 12 must be identified correctly.	M/identifying objects & symbols	
7 A.1.1.1.1.1 Identify colors	none			
8 A.1.1.1.1.2 Identify shapes	none			
9 A.2 Use compass	1008 A.2	Given a compass in unfamiliar terrain, the trainee will determine the directions: North, East, South and West, from his location	M/rule learning & using	
10				
11	A.2 enabling skills and knowledges not shown			
12				
13				
14 B Hike with pack	1008 B	Given a 40 lb backpack, the trainee will hike non-stop from point A to point B within 3 hours	P/gross motor skill	

H-34

What does a Learning Objective LP Card look like after the TLO group letter has been recorded on it?

EXAMPLE:

LEARNING OBJECTIVE LP CARD

Task # 330-575-1008

Element/Enabling S&K # A

Learning Category/Subcategory M/ Rule learning & using

Learning Objective # 1008-A

LO Sequence # ______

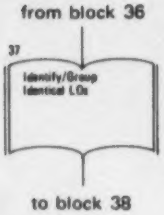
LO Group Letter ______

TLO Sequence # 1

TLO Group Letter A

Action Statement:

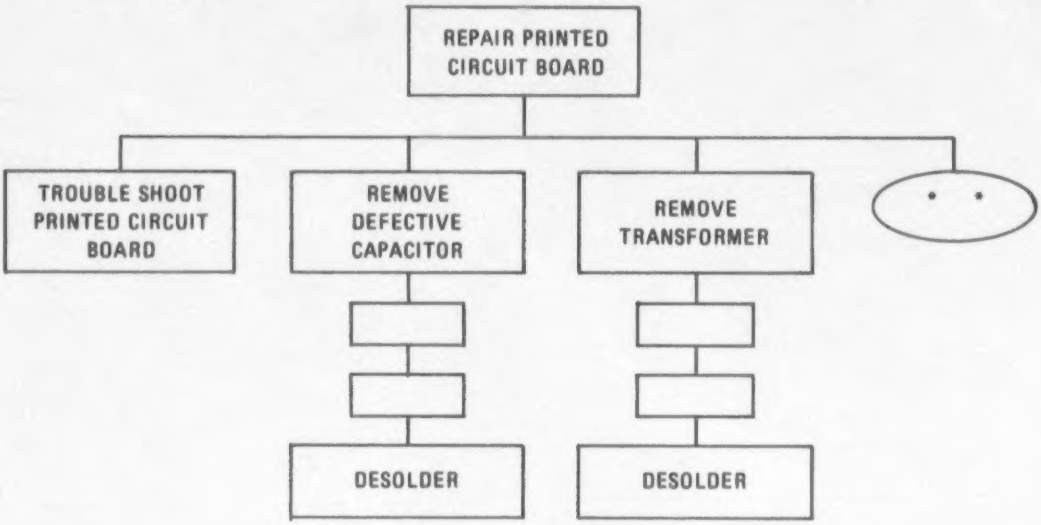
Orient map & compass


from block 36
37
Identify/Group
Identical LOs
to block 38

- Some tasks may contain LOs for elements or skills and knowledges that are the same as for other tasks. In this step these LOs are identified and grouped together.
- For further guidance, see below.

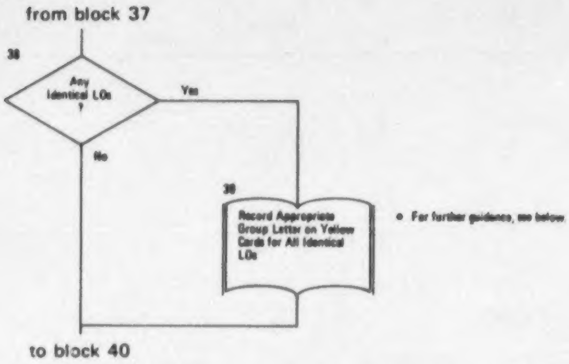
How do I identify and group identical learning objectives?

- Some tasks may contain learning objectives for elements or skills and knowledges that are the same as for other tasks. It is important that these identical LOs be identified at this point because in many cases you will want to schedule the training for these LOs so that they are only taught one time. Generally, the training for these LOs should occur when the task containing one of these identical LOs is first taught. For example, look at the partial learning analysis below:


REPAIR PRINTED CIRCUIT BOARD
TROUBLE SHOOT PRINTED CIRCUIT BOARD
REMOVE DEFECTIVE CAPACITOR
REMOVE TRANSFORMER
• •
DESOLDER
DESOLDER

- Consider the learning objective "desolder." It occurs under both "remove defective capacitor" and "remove transformer." You will probably want to schedule the teaching of desoldering only one time. If previously you had determined that the task element, "remove defective capacitor" was to be trained before "remove transformer" then desolder would be scheduled for training only as a part of the training for "remove defective capacitor." It would be assumed that desoldering training would not need to be repeated when providing training for "removing the transformer."

- Follow this procedure for identifying and grouping identical LOs:
  1) Sort into stacks all Learning Objective LP Cards that contain identical action statements.
  2) Check these Learning Objective LP Cards against the LOD Sheets to be certain that the conditions and standards for each is also identical or very similar.
  3) Alphabetize each stack by TLO Group Letter.


from block 37
38
Any Identical LOs ?
Yes
No
39
Record Appropriate Group Letter on Yellow Cards for All Identical LOs
• For further guidance, see below
to block 40

What and where do I record the learning objective group letter for LO's that are identical?

- The LO Group Letter is the same as the TLO Group Letter of the top card of the stack of alphabetized Learning Objective LP Cards.

- The LO Group Letter is recorded in the upper right corner of all Learning Objective LP Cards in the stack.

- It will be necessary for you to change the LO Sequence number on all of the Learning Objective LP Cards in the stack except for the top card.
  - Draw a line through the Sequence number originally recorded
  - Record on all cards in the stack the LO Sequence number shown on top card in the stack

SUMMARY: All Learning Objective LP Cards in the stack of identical LOs will have the same LO Group Number and LO Sequence Number.

What does a Learning Objective LP Card look like after the LO group letter has been recorded and the LO sequence # has been changed?

EXAMPLE:

LEARNING OBJECTIVE LP CARD

Task # 330-575-1022

Element/Enabling S&K # D

Learning Category/Subcategory M/ rule learning & using

Learning Objective # 1022-D.1

LO Sequence # ~~3~~ 1

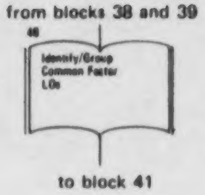
LO Group Letter A

TLO Sequence # 4

TLO Group Letter D

Action Statement:

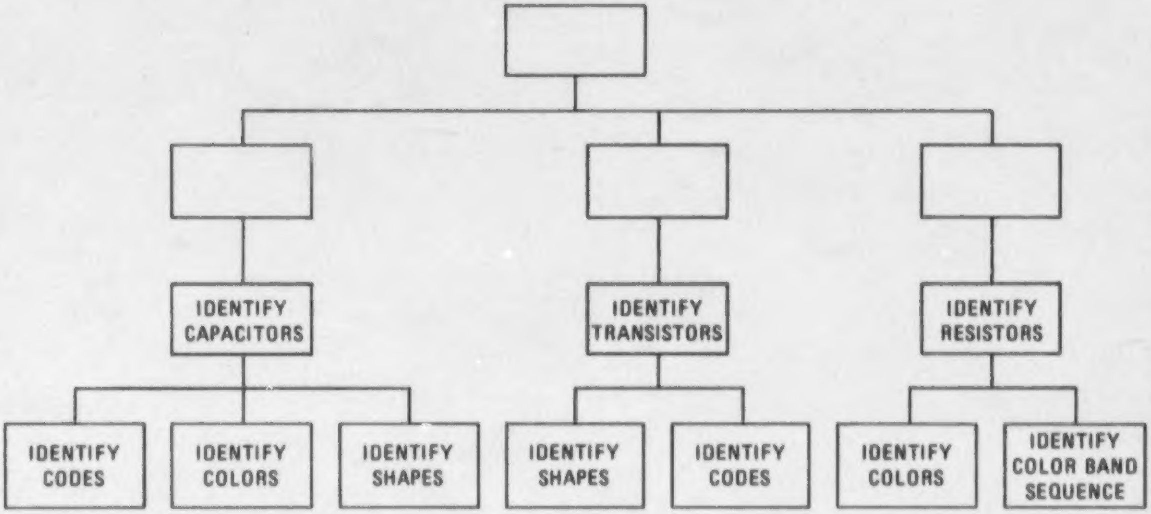
Orient map and compass


from blocks 38 and 39
40
Identify/Group
Common Factor
LOs
to block 41

- Common factor learning objectives are LOs that have identical action words and similar objects of the action in the learning objective statement.
- For further guidance on how to sequence common factor objectives, see below.

How do I identify and group common factor learning objectives?

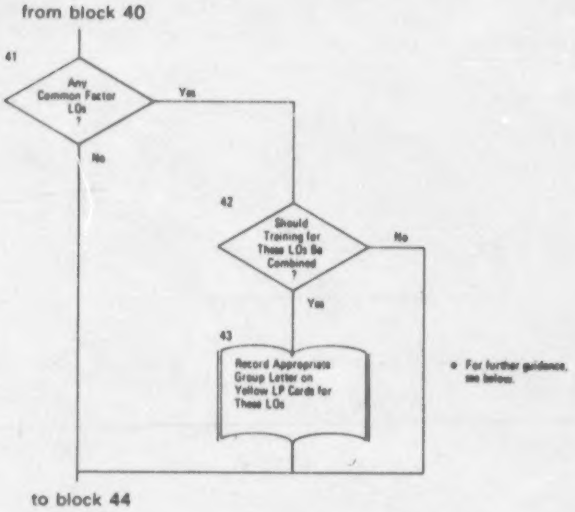
- The example below describes what common factor learning objectives are.


IDENTIFY CAPACITORS
IDENTIFY TRANSISTORS
IDENTIFY RESISTORS
IDENTIFY CODES
IDENTIFY COLORS
IDENTIFY SHAPES
IDENTIFY SHAPES
IDENTIFY CODES
IDENTIFY COLORS
IDENTIFY COLOR BAND SEQUENCE

- In the above example note that "identify capacitors," "identify transistors" and "identify resistors" each have the common factor of identify as the common factor between them. One logical way to handle these common factor learning objectives is to consider grouping all "identify" learning objectives and place them near the beginning of the course.

- While common factor learning objectives generally should be listed early in the sequence because they represent information or skills basic to many learning objectives, the delay between introducing such objectives and the actual application of the objectives should be minimized. This is so that material learned at the beginning of training will not be forgotten by the time it is practiced as a part of other learning objectives.

- The procedure to use for identifying and grouping common factor learning objectives is as follows:
  1) Sort into stacks all Learning Objective LP Cards which have common factor elements
  2) Check these Learning Objective LP Cards against the LOD Sheets to be certain that after examining the conditions and standards for these LOs they should still be grouped together.
  3) Alphabetize each stack by TLO Group Letter.


from block 40
41
Any Common Factor LOs ?
Yes
No
42
Should Training for These LOs Be Combined ?
No
Yes
43
Record Appropriate Group Letter on Yellow LP Cards for These LOs
• For further guidance, see below.
to block 44

What and where do I record the learning objective group letter for LO's that have common factors?

The procedure to use for determining what to record and where to record it for common factor LOs is the same as that for identical LOs. That is:

- The LO Group Letter is the same as the TLO Group Letter of the top card of the stack of alphabetized Learning Objective LP Cards.
- The LO Group Letter is recorded in the upper right corner of all Learning Objective LP Cards in the stack.
- It will be necessary for you to change the LO Sequence number on all of the Learning Objective LP Cards in the stack except for the top card.
  - Draw a line through the Sequence number originally recorded
  - Record on all cards in the stack the LO Sequence number shown on the top card in the stack

SUMMARY: **All Learning Objective LP Cards in the stack of common factor LOs will have the same LO Group number and LO Sequence number.**

What does a Learning Objective LP Card look like after the LO group letter has been recorded and the LO sequence # has been changed?

EXAMPLE:

LEARNING OBJECTIVE LP CARD

Task # 330-575-1222

Element/Enabling S&K # P

Learning Category/Subcategory N/identify objects

Learning Objective # 1222-1.1.2

LO Sequence # ~~7~~ 3

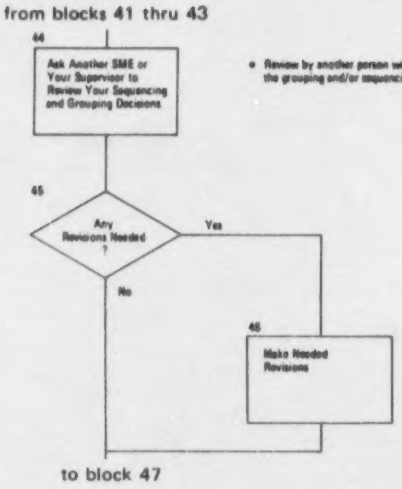
LO Group Letter C

TLO Sequence # 14

TLO Group Letter E

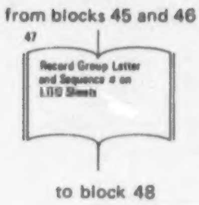
Action Statement:

Identify codes


from blocks 41 thru 43
44
Ask Another SME or Your Supervisor to Review Your Sequencing and Grouping Decisions
45
Any Revisions Needed ?
Yes
No
46
Make Needed Revisions
to block 47

- Review by another person will help reveal any misclassifications in the the grouping and/or sequencing of objectives.

278


from blocks 45 and 46
47
Record Group Letter and Sequence # on LOD Sheets
to block 48

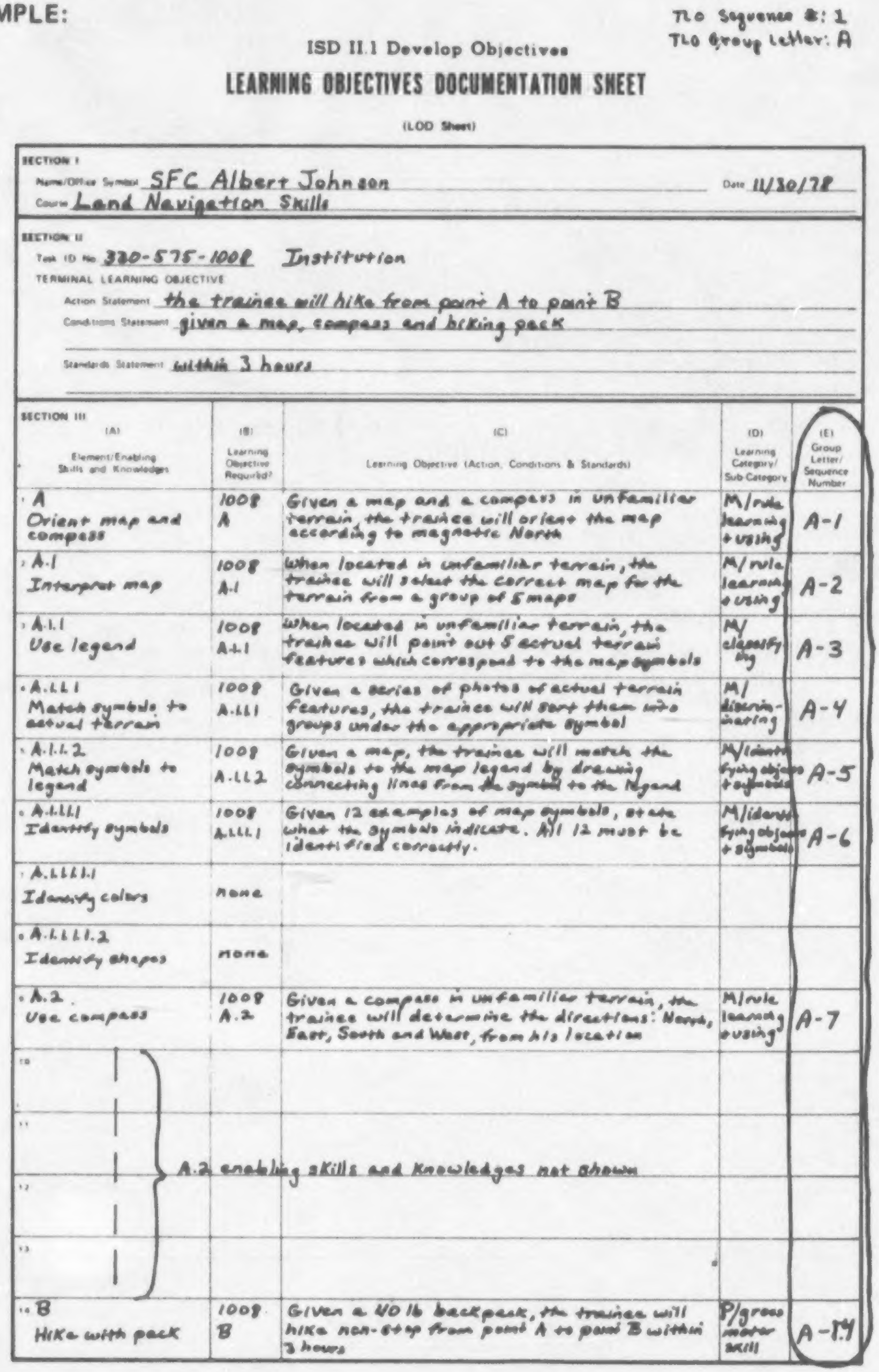
- For example, see below.

What group letter and sequence # do I record and where do I record it on the LOD Sheet?

- The Group Letter and Sequence number are those recorded in the blanks for LO Group Letter and LO Sequence number. However, in some cases there may not have been a LO Group Letter and/or a LO Sequence number assigned. In these cases use the entry made for TLO Group Letter and/or TLO Sequence number.
- Record the appropriate Group Letter and Sequence number in Section III, Column E of the LOD Sheet.
- Check to be certain that there is a Group Letter/Sequence Number entry for each element/enabling skills and knowledges shown on the LOD Sheet for which a learning objective was required (Column B).

What does the LOD Sheet look like after the group letter/ sequence number have been recorded?

EXAMPLE:



TLO Sequence #: 1
TLO Group Letter: A

ISD II.1 Develop Objectives

LEARNING OBJECTIVES DOCUMENTATION SHEET

(LOD Sheet)

SECTION I

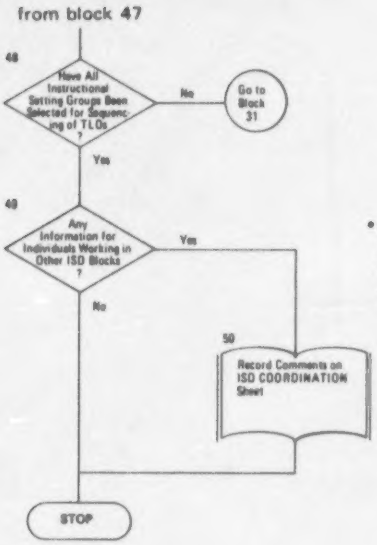
Name/Office Symbol SFC Albert Johnson Date 11/30/78
Course Land Navigation Skills

SECTION II

Task ID No. 330-575-1008 Institution
TERMINAL LEARNING OBJECTIVE
Action Statement the trainee will hike from point A to point B
Conditions Statement given a map, compass and hiking pack
Standards Statement within 3 hours

SECTION III

(A) Element/Enabling Skills and Knowledges	(B) Learning Objective Required?	(C) Learning Objective (Action, Conditions & Standards)	(D) Learning Category/ Sub Category	(E) Group Letter/ Sequence Number
A Orient map and compass	1008 A	Given a map and a compass in unfamiliar terrain, the trainee will orient the map according to magnetic North	M/rule learning + using	A-1
A.1 Interpret map	1008 A.1	When located in unfamiliar terrain, the trainee will select the correct map for the terrain from a group of 5 maps	M/rule learning + using	A-2
A.1.1 Use legend	1008 A.1.1	When located in unfamiliar terrain, the trainee will point out 5 actual terrain features which correspond to the map symbols	M/ classifying	A-3
A.1.1.1 Match symbols to actual terrain	1008 A.1.1.1	Given a series of photos of actual terrain features, the trainee will sort them into groups under the appropriate symbol	M/ discriminating	A-4
A.1.1.2 Match symbols to legend	1008 A.1.1.2	Given a map, the trainee will match the symbols to the map legend by drawing connecting lines from the symbol to the legend	M/identifying objects + symbols	A-5
A.1.1.1.1 Identify symbols	1008 A.1.1.1.1	Given 12 examples of map symbols, state what the symbols indicate. All 12 must be identified correctly.	M/identifying objects + symbols	A-6
A.1.1.1.1.1 Identify colors	none			
A.1.1.1.1.2 Identify shapes	none			
A.2 Use compass	1008 A.2	Given a compass in unfamiliar terrain, the trainee will determine the directions: North, East, South and West, from his location	M/rule learning + using	A-7
10		A.2 enabling skills and Knowledges not shown		
11				
12				
13				
14 B Hike with pack	1008 B	Given a 40 lb backpack, the trainee will hike non-stop from point A to point B within 3 hours	P/gross motor skill	A-14


from block 47
48
Have All Instructional Setting Groups Been Selected for Sequencing of TLOs ?
No
Go to Block 31
Yes
49
Any Information for Individuals Working in Other ISD Blocks ?
Yes
No
50
Record Comments on ISD COORDINATION Sheet
STOP

- During the sequencing and structuring process information may have been obtained that would be useful to persons who performed activities that led into this block. Similarly, information may have been obtained that would be useful to persons who will be engaged in Instructional Systems Development steps that follow this one.

- Comments are recorded and submitted to appropriate persons.
- For further guidance, see below.

What is the importance of preparing comments for people working in other steps of the instructional systems development process? How do I record them?

- In order for the Instructional Systems Development process to work effectively it is imperative that there be forward and backward communication between the people involved in the process. At some time or other you have probably complained about the input that has been provided to you. Sometimes, you may have had to do work that should have been performed in previous steps.

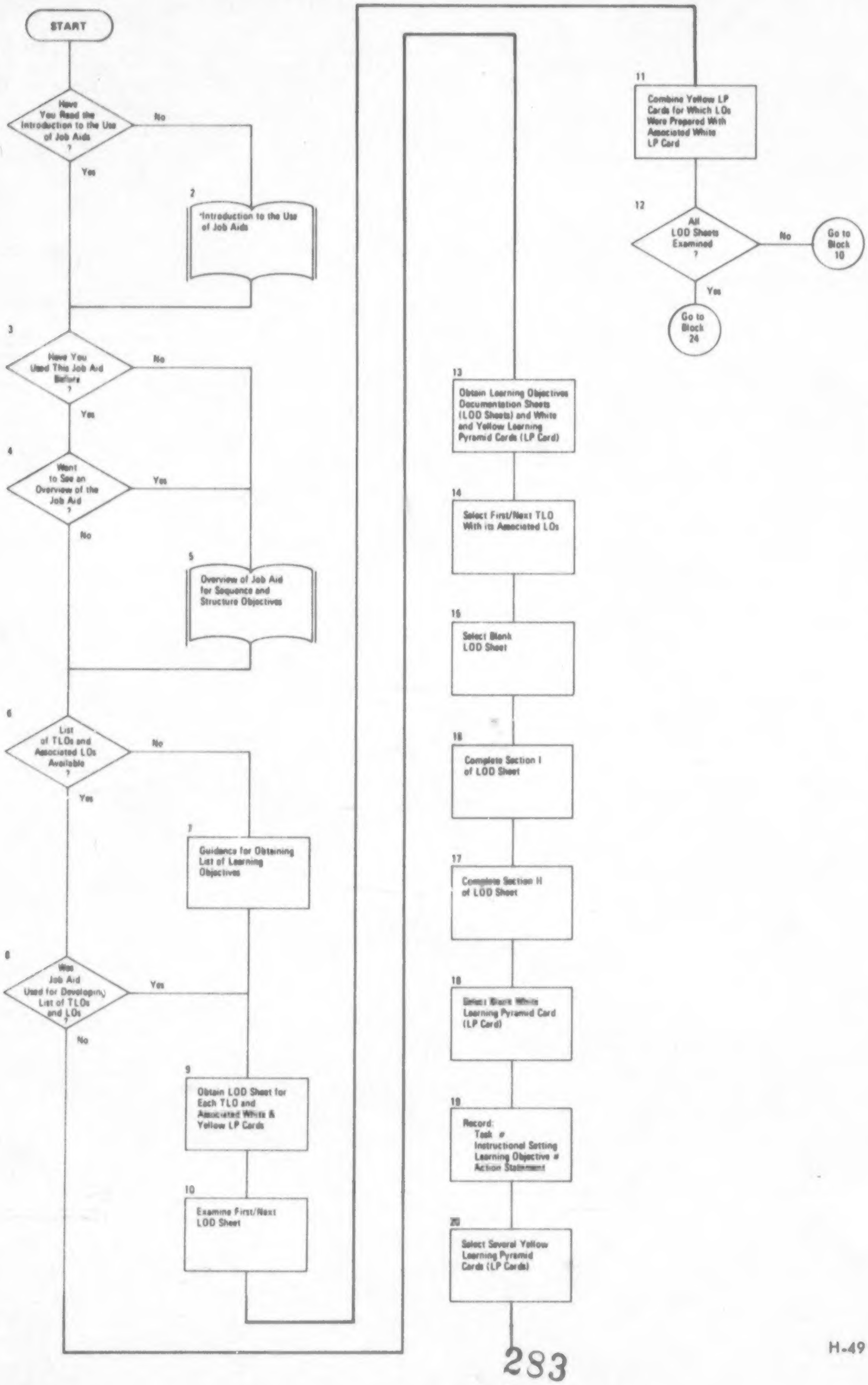
IT IS IMPORTANT THAT YOU FEED THIS INFORMATION BACK TO THE APPROPRIATE PEOPLE SO THAT REVISIONS CAN BE MADE TO EFFECT IMPROVEMENT IN THE END PRODUCT.

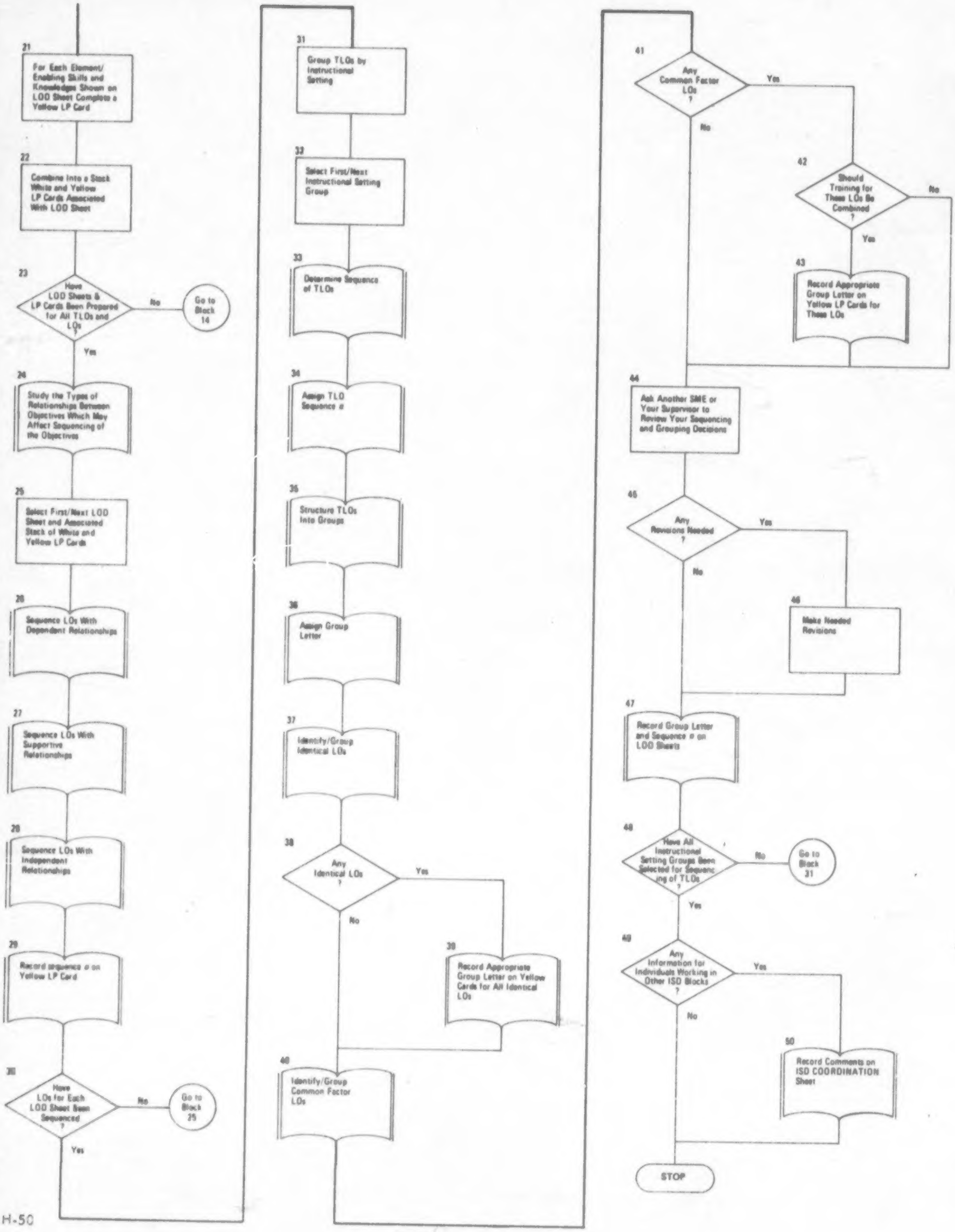
In your research for this step of the Instructional Systems Development process you may have discovered additional information that you think may be useful to people who will be working in steps that follow this one. If so, it is equally important that you pass this information on to appropriate people.

REMEMBER, COMMUNICATION WITHIN THE INSTRUCTIONAL SYSTEMS DEVELOPMENT PROCESS IS CRITICAL FOR EFFECTIVE INSTRUCTIONAL DEVELOPMENT FOR SUCCESSFUL MISSION ACCOMPLISHMENT.

- A copy of the ISD COORDINATION SHEET can be found in the back of this manual. Make sufficient copies to enable you to send one to every individual you wish to communicate with—plus copies for your records.

- Complete the ISD COORDINATION SHEET in duplicate. Send one copy to the individual and attach one copy to the Instruction Settings Selection Package (IRS Sheets).


START
Have You Read the Introduction to the Use of Job Aids ?
No
Yes
2
"Introduction to the Use of Job Aids
3
Have You Used This Job Aid Before ?
No
Yes
4
Want to See an Overview of the Job Aid ?
Yes
No
5
Overview of Job Aid for Sequence and Structure Objectives
6
List of TLOs and Associated LOs Available ?
No
Yes
7
Guidance for Obtaining List of Learning Objectives
8
Was Job Aid Used for Developing List of TLOs and LOs ?
Yes
No
9
Obtain LOD Sheet for Each TLO and Associated White & Yellow LP Cards
10
Examine First/Next LOD Sheet
13
Obtain Learning Objectives Documentation Sheets (LOD Sheets) and White and Yellow Learning Pyramid Cards (LP Card)
14
Select First/Next TLO With its Associated LOs
15
Select Blank LOD Sheet
16
Complete Section I of LOD Sheet
17
Complete Section II of LOD Sheet
18
Select Blank White Learning Pyramid Card (LP Card)
19
Record:
Task #
Instructional Setting
Learning Objective #
Action Statement
20
Select Several Yellow Learning Pyramid Cards (LP Cards)
11
Combine Yellow LP Cards for Which LOs Were Prepared With Associated White LP Card
12
All LOD Sheets Examined ?
No
Go to Block 10
Yes
Go to Block 24


21
For Each Element/ Enabling Skills and Knowledges Shown on LOD Sheet Complete a Yellow LP Card
22
Combine Into a Stack White and Yellow LP Cards Associated With LOD Sheet
23
Have LOD Sheets & LP Cards Been Prepared for All TLOs and LOs ?
No
Go to Block 14
Yes
24
Study the Types of Relationships Between Objectives Which May Affect Sequencing of the Objectives
25
Select First/Next LOD Sheet and Associated Stack of White and Yellow LP Cards
26
Sequence LOs With Dependent Relationships
27
Sequence LOs With Supportive Relationships
28
Sequence LOs With Independent Relationships
29
Record sequence # on Yellow LP Card
30
Have LOs for Each LOD Sheet Been Sequenced ?
No
Go to Block 25
Yes
31
Group TLOs by Instructional Setting
32
Select First/Next Instructional Setting Group
33
Determine Sequence of TLOs
34
Assign TLO Sequence #
35
Structure TLOs Into Groups
36
Assign Group Letter
37
Identify/Group Identical LOs
38
Any Identical LOs ?
Yes
No
39
Record Appropriate Group Letter on Yellow Cards for All Identical LOs
40
Identify/Group Common Factor LOs
41
Any Common Factor LOs ?
Yes
No
42
Should Training for These LOs Be Combined ?
No
Yes
43
Record Appropriate Group Letter on Yellow LP Cards for These LOs
44
Ask Another SME or Your Supervisor to Review Your Sequencing and Grouping Decisions
45
Any Revisions Needed ?
Yes
No
46
Make Needed Revisions
47
Record Group Letter and Sequence # on LOD Sheets
48
Have All Instructional Setting Groups Been Selected for Sequencing of TLOs ?
No
Go to Block 31
Yes
49
Any Information for Individuals Working in Other ISD Blocks ?
Yes
No
50
Record Comments on ISD COORDINATION Sheet
STOP